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AUDIO-VISUAL AIDS TO INSTRUCTION

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AUDIO-VISUAL AIDS TO INSTRUCTION

By

HARRY C. McKOWN

Author of "Extracurricular Activities," "School Clubs," "Assembly and Auditorium Activities," "Commencement Activities," "Home Room Guidance," "Character Education," "Activities in the Elementary School," "How to Pass a Written Examination," "The Student Council"

and

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Second Edition

Bureau Ednl. Psy. Research
DAVID H. ING COLLEGE
Dated 15-3-56
Accs. No. 1003

New York Toronto London
McGRAW-HILL BOOK COMPANY, INC.
1949

371.335
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AUDIO-VISUAL AIDS TO INSTRUCTION

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PREFACE

Immediately following the end of the Second World War, education began to be a main topic of discussion in newspapers, popular books and magazines, on radio broadcasts, and in the programs of numerous nonprofessional organizations and institutions. This discussion developed to such an extent that *The New York Times* called the "educational crisis" the "most important news story of 1947." Undoubtedly, much of this attention was due originally to financial difficulties, directly and indirectly.

Naturally enough, with the discussion of financial problems came a correlative critical examination of the returns on our educational investment and, in turn, on what had been going on behind the educational "iron curtain" during the past few decades. Public opinion, formerly centered on the easily seen externals of education—buildings, stadiums, interscholastic competitions, public spectacles, and so on, began to center on less easily seen internals—objectives, organization, curricula, techniques, materials, and successes and failures.

In such an examination it was inevitable that the "failure" of the school, especially the secondary school, should attract most attention. This failure was readily apparent in the deplorable record of dropouts due to the high school's emphasis upon a college-preparatory function—with the consequent elimination of those students who were "unfit for college"—and its lamentable lack of appreciation of the fact that only a relatively small proportion, less than one-fourth, of its graduates ever enter college. Through the years this preparatory emphasis has fostered the development of a defeatist philosophy, which placed a premium upon student failures instead of upon student successes. Little wonder that even today only about forty per cent of all students who enter the high school as freshmen ever graduate! And little wonder that present-day discussion of education has been adverse.

However, it must not be assumed that all educators have been blind to this failure. Far from it; for a number of years the more progressive-minded have been decrying this thoroughly illogical and unjustifiable waste and have been making serious attempts to lessen and prevent it. Proof of the success of their efforts is to be found in such educational movements as measurement, guidance, curricular development, grade and district reorganization, and the audio-visual movement. The last-mentioned was developing rapidly when the war came. However, the war very definitely established audio-visual materials and techniques as meritorious educational devices, and the postwar critical discussion of education just as definitely established a most favorable setting for their utilization and further development.

Although audio-visual instruction was practically unheard of two decades ago, the development of this field has been astounding. Evidence of this fact is to be found in the number and variety of aids manufactured and marketed; the professional employment of teachers, supervisors, and directors; appropriate provisions made in new buildings; the number of state and national organizations of producers and consumers of audio-visual equipment and materials; and in the recent literature—specialized books, pamphlets, and journals, as well as articles in professional and popular magazines. To illustrate the last item: of the 700 references in this book, approximately 525 were dated 1940 or later, 150 appeared during the period 1935 to 1940, and 25 were published prior to 1935. Many of the pre-1940 articles are to be found in less than six yearbooks and similar publications. Since these references were really "selected" they are not all-inclusive. Naturally, this revision reflects recent developments.

Although organized generally like the original volume, this edition has five additional chapters. All but eleven of the illustrations are new, and the bibliographies have been brought up to date. In response to a personal letter, more than one hundred users of the original edition contributed suggestions, ideas, and materials for the production of this edition. And every chapter, while in manuscript form, was read critically by from two to five audio-visual workers for whose professional competency the authors have respect.

Because the final measure of the value of any audio-visual program must be based upon what actually happens in the classroom, the main emphasis of this volume is upon practice. The discussions of administration and supervision contribute to this ideal of improved classroom utilizations. Not only is this viewpoint stressed in the presentation of the various types of aid, but about one-third of the book consists of explicit classroom lessons and procedures. Incidentally, these illustrative lessons reflect the present trend toward a closer correlation of courses and subjects. Also, the aids are presented not as separate and distinct devices around which lessons are built but as definitely correlated and integrated parts of the lessons themselves.

What are audio-visual aids? Specifically, how, to what extent, and under what conditions do they "aid"? Which types are best suited to the various grade levels, subjects, and kinds of instructional materials within these subjects? How can they be utilized to replace antiquated and obsolete methods and materials? How can they be incorporated as integrative and supplementary, rather than as separate and substitutionary, agents? In what ways can they be utilized most effectively? How can teacher and community support be developed? How much do the aids cost? Where can they be obtained? The purpose of this book is to answer these and other pertinent questions.

Obviously, it would be impossible to tell the whole story of audio-visual instructional possibilities in a single volume. Therefore, the authors have emphasized the phases that, in their opinion, will be most useful and helpful to teachers and administrators. Similarly, the references have been carefully selected on the basis of pertinency, practicability, availability, recency, and variety.

The reader of this or any similar book should remember that, as a general movement, audio-visual instruction is still in its infancy. Consequently, the reader should not assume that all the questions suggested above can now be answered completely, conclusively, accurately, and permanently. The present pioneering efforts of the leaders in education and production will result in new and improved materials, equipment, organization, techniques, and emphases, which ultimately will bring more complete answers to these questions. In this work of pioneering the teacher herself will have an important part through utilizing, adapting, experimenting, and evaluating. This is both her opportunity and her responsibility.

The authors wish to express their appreciation to the many persons who have helped to make this book possible and to the various publishers for permission to use copyrighted materials. They are especially grateful to the following for constructive criticisms and helpful suggestions: Irene Anderson, Glen Oak School, Peoria; Norma Barts, Educational Consultant, British Information Service, Chicago; Elizabeth Bloss, C. M. Bardwell School, Aurora, Ill.; Floyde E. Brooker, Chief, Visual Aids to Education, and Gertrude E. Broderick, Radio Education Specialist, U.S. Office of Education, Washington; C. A. Burkhart, Editor, A. J. Nystrom & Company, Chicago; Lee W. Cochran, Extension Division, State University of Iowa, Iowa City; C. R. Crakes, Educational Consultant, DeVry Corporation, Chicago; Vernon Dameron, Executive Secretary, Department of Audio-Visual Instruction, National Education Association, Washington; Joseph E. Dickman, Encyclopaedia Britannica Films Inc., Chicago; Dorothy I. Dixon, Assistant County Superintendent of Schools, Macomb, Ill.; Walter E. Eggert, Professor of Education, DePaul University, Chicago; W. W. Freeman, Director of Audio-Visual Instruction, East Texas State Teachers College, Commerce; Leslie E. Frye, Director, Division of Visual Education, Cleveland; John H. Griffith, Director of Audio-Visual Education, Galesburg, Ill.; Josephine Hoffman, Educational Screen, Inc., Chicago; Emily S. Jones, Executive Secretary, Educational Film Library Association, Inc., New York; Kathleen N. Lardie, Manager, Station WDTR, FM Educational Radio Station of the Detroit Public Schools, Detroit; Vernon L. Nickell, State Superintendent of Public Instruction, Springfield, Ill.; Alan H. Nicol, Supervisor of Visual Education, Buffalo; L. V. Peterson, Director, Visual Aids Service, University of Illinois, Urbana; Del Shelley, Director, Department of Audio-Visual Instruction, Phoenix, Ariz.; William Sherrill, Specialist in Subject Matter, Agricultural and Mechanical College of Texas, College Station; Harriett Stull and Janette Terrill, Western Illinois State College, Macomb; A. G. Tillman, Head of Geography Department, Western Illinois State College, Macomb; Lelia Trolinger, Director, Bureau of Audio-Visual Instruction, University of Colorado, Boulder; P. R. Wendt, Director, Visual Education Service, University of Minnesota, Minneapolis; Burton L. Westfall, Principal, The Laboratory School, Indiana State Teachers College, Terre Haute; and W. A. Wittich, Director, Bureau of Visual Instruction, University Extension Division, University of Wisconsin, Madison.

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GILSON, KNOX COUNTY, ILL.
June, 1949

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EDITOR'S INTRODUCTION TO THE SECOND EDITION

Since the first edition of this book was published, fast-moving events have indicated that the world is lagging behind its communication potentials. The actors on the international stage, with means of communication at hand permitting practically simultaneous speech over continents and across oceans, still address one another almost as though they were back in the days of mounted messengers and smoke signals. New communication instruments are added to old ways with the effect sometimes of making the total pattern of communication more outdated than before. An artificially revived language like Erse is heard over the public-address system at an international airport where everybody speaks English, giving the effect of a weird solecism in reverse, as though tenth-century chain mail were to be draped over the nose of a B-36. In similar manner, an old-fashioned political orator, roaring and sobbing over the radio, sounds far more moth-eaten and backward than he could possibly have been when he hammered the rostrum on a Fourth-of-July picnic platform in the days of firecrackers and fringe-top surreys.

This phenomenon of mixing enough new with the old to make the whole effect seemingly more ancient than it is, can be found also in education. How many professors in the last thirty years have lectured droningly and drearily, without even raising a hand to the blackboard, on visual instruction? How many school men and women, having heard phonographs in their homes for fifty years, having attended movies for forty years, and having used radios for thirty years, still teach with only the aids to instruction which were available in 1900? For how many years will they watch television programs before they begin to use this obviously tremendous instrument for direct educational purposes?

The first edition of this book was widely used by teachers and administrators who believed that something should be done to recognize and utilize new media of communication in what is the most significant of all means of communication, the education of children, young people, and adults.

The school men and women of the United States have found the first edition of this book very useful in helping them to improve their skills for this great service. It is the belief of the publishers and the editor that they will find the new edition an even more complete and stimulating instrument for this task.

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EDITOR'S INTRODUCTION TO THE FIRST EDITION

In spite of the fact that education is a most important human agency, which by its very nature requires thorough understanding and utilization of all means of communication, it is often the last to employ new and improved methods for the transmission of thought. For a long time after the invention of printing, lectures and manuscript notes were thought to have a certain pedagogical superiority over the products of the presses. Even today an occasional university professor drones forth his daily quota of facts and theories from lecture notes in disregard of the economy of time and effort which might be gained by having his students consult the same printed sources from which he derives his own classroom wisdom.

In most areas of education, however, the value of books and other printed materials has long been recognized. In the meantime new means of communication have been developed. Such powerful instruments as the phonograph, the motion picture, and the radio have been perfected and used extensively outside the school. Their strength and usefulness have been demonstrated. The part they can be made to play in the modification of human behavior is seen to be undeniably very great. Yet the great mass of teachers on every level of the school cling to the book in what amounts almost to a passionate devotion.

Teachers do well to cling to the book if they will only cling to it with eyes open to the uses of other than printed aids to learning. With each step forward in the improvement of newer means of communication it is not at all true that the importance of printed materials necessarily diminishes. In some cases it becomes greater, as when a pupil reads *Silas Marner* with increased vividness of appreciation after having seen the motion-picture production of that classic, or studies his geography with a wealth of concrete imagery about Antarctica derived from hearing the broadcasts from Little America. In fact it is very probable that the potential value of the book as an aid to learning was never so great as it is today precisely because of the development of auxiliary devices for the interchange of ideas and emotions.

Under these circumstances every teacher needs to have at his command all the tools of the trade in order to be truly successful with any one of them. He will avoid the quackery of relying upon a single cure-all supposedly good for all situations. He will not try to teach history by book and lecture alone any more than he will fall into the notion of teaching natural science by exclusive use of microscope and test tube. He will recognize the essential purposes of each phase of his instruction. He will study the factors in each learning situation. He will know the capacities of his pupils and how their abilities and interests may be directed. Then, upon the sure foundation of a sound and comprehensive knowledge of the teaching problem in any instance, he will select methods, devices, and aids to learning which in his best judgment will give superior results. He will study the operation of those factors as he employs them, shifting them, changing them, replacing them as the need arises. Thus he will be a professional worker with a full complement of skills and instruments rather than a rule-of-thumb operator who has faith in only two or three prescriptions because those are all he knows.

The present volume is an admirable guide for one who wishes to reach this professional level of skill with respect to the audio-visual aids. It discusses the principles and describes the practices whereby education is being profoundly changed in method of presentation. It is a handbook for the teacher and administrator who hold to the ancient goal of the greatest learning with the least pain.

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I

THE SCOPE OF AUDIO-VISUAL INSTRUCTION

In an earlier day American life, though hard, was comparatively simple. Communities were small, occupational activities centered largely in the home, religious attitudes were strict, and recreational pursuits were limited. Little formal education was necessary, and little was provided. However, that little was valued highly; the school took its place alongside the church as an essential community institution. The school was as simple in building, curriculum, organization, and administration as the community that supported it. It was relatively inexpensive. The schoolmaster, carefully selected but largely unsupervised, taught what he wanted to teach and taught it in his own way. And, considering his limited educational ideals, program, and equipment, he was probably at least fairly successful in his work.

Following the Revolution came unprecedented expansion. Population grew by leaps and bounds; villages with favorable industrial and commercial advantages rapidly became cities; inventions and discoveries increased man's interests and activities; mental and social boundaries were pushed back; and society in all of its phases became much more complex. Paralleling these other developments, formal education also increased in purpose, extent, and complexity; the one-room rural school became a large, and often an immense, plant; little or no special equipment grew into a great array of appliances, materials, and devices; the three R's developed into an amazing schedule of general and diversified curricula; unspecialized teaching gave way to specialized instruction; the single untrained schoolmaster was replaced by a faculty of more or less well-prepared specialists; and, of course, the small cost grew into a large expenditure.

Naturally, such a phenomenal development of formal education came because of approving public support. But, just as naturally, this support was not unanimous. Two important outside critics appeared.

One of these believed in education but was skeptical of the means, methods, and materials by which it was promoted, as well as of the extent to which it was achieved. Demanding efficiency in the other phases of his life, he also demanded efficiency in educational affairs. The second outside critic knew little about education and probably cared even less but was interested in keeping down its rapidly mounting cost. Taking advantage of the opportunity, two insiders immediately joined the outside skeptics. One was a rather intelligent opportunist who was quick to realize that it was not complimentary to have outsiders pick out faults and weaknesses that he should have seen first, and the other was a serious-minded educator who had always been sincerely desirous of improving practice in his field. And for other reasons additional outside and inside critics were quick to support the traditional and conservative in education. As a result, education is being discussed at the present time, both favorably and unfavorably, more than ever before in the history of the nation. This discussion has had, and will have, wholesome effects upon our educational ideals, methods, and materials.

Modern society is still willing to pay for education, but it is increasingly demanding proof of the value of its investment. It is demanding businesslike efficiency in educational activities. In general, the thinking element is coming to care little more for traditions in education than it does for traditions in transportation, manufacturing processes, or wearing apparel. Increasingly, its attention is being centered on what is, or what should be, accomplished in the lives of children and young people—the citizens of tomorrow.

Note some of the results of these outside and inside criticisms: educators have originated, developed, and promoted many new and readapted types of organization, materials, devices, and procedures, such as the junior high school, junior college, general subjects, new courses, integration of subject matter, socialized recitation, organized guidance, scientific measurement, personnel work, extracurricular activities, school-district reorganization, pupil transportation, and modern housing. Undoubtedly, much progress has been made toward the ideal that society is demanding. Just as certainly, more progress will be made as educators acquire additional experience and with it greater maturity in their profession.

One of these newer educational movements, and one which promises to have a tremendous influence because it attacks the problem vitally at the bottom through actual teaching instead of more or less superficially at the top through reorganization, is audio-visual instruction.[1]

WHAT IS MEANT BY AUDIO-VISUAL INSTRUCTION?

Until experience has defined and matured them, at least some of the purposes, activities, and materials of a new field are certain to be misunderstood and misinterpreted. Hence, a brief discussion of the meaning of audio-visual instruction is in order. It may appear to be putting the cart before the horse, but because of the widespread misinterpretations of audio-visual instruction, the elimination of the most common of these at the very beginning will help to point the way from what it is not to what it is.

Audio-visual instruction is not a separate school subject. In teacher-training institutions there are departments of, and courses in, audio-visual instruction; but in its applied form it is not a subject separate from the other subjects of the curriculum. Like composition it has no content of its own. It permeates all instruction. It is a part of a teaching method designed to aid in the presentation of materials—knowledge, concepts, and ideas—in literature, mathematics, science, shopwork, and other fields, both curricular and extracurricular, in order that they are more easily and clearly understood, appreciated, and applied. Audio-visual aids do not exist separately. They are not instructional in themselves. They are, in reality, only aids to instruction.

Audio-visual instruction is not a substitutive educational device. For many centuries in man's early history after speech developed, experience was transmitted and instruction was given largely through the spoken word. Some six thousand years ago the written word came into existence. Today these two—the spoken word and the written word—are still the most important channels of instruction, and they will probably remain so despite those individuals who fear "robot instruction" and those prophets who see teachers and books shortly replaced by the radio, electric transcriptions, films, television, and other devices now included in the audio-visual program. As suggested before, these devices are supplementary only. They are not self-contained teaching devices.[2] They will never replace good textbooks and effective teaching techniques. Listening to, reading about, and observing will always be done, but they will be done more successfully and happily through a proper capitalization of these aids. The

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[1] Two scholarly views of the origins of the visual idea are presented by Wendell Thomas in The Stream of Perceptual Teaching, *Educational Screen,* vol. 18, pp. 326–327, November, 1939; and Manson Milner Brien in Notes on the Historical Background of Visual Education, *Education,* vol. 61, pp. 321–325, February, 1941.

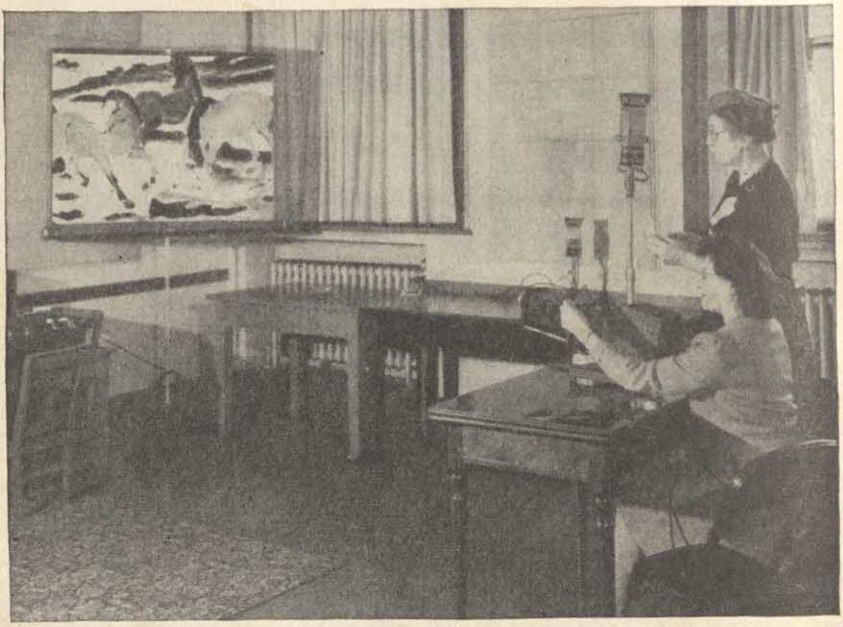

FIG. 1. Synchronizing a radio talk with slide projection. (*Courtesy of Cleveland Public Schools.*)

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[2] In his article, The Educational Film: Visual Aid or Visual Teacher? William S. Hockman criticizes this "supplementary" idea. Says he: "The film will never reach its full flower of development as long as it is considered as just another form and variety of lecture and textbook material. It must be developed, and then used, in accordance with its own inherent and unique powers. . . . It will no longer be used just to give the pupils a gentle shove as they shuffle along in old processes but will provide primary and direct learning experience for them." This challenging article will be found in *Educational Screen*, March, 1948, pp. 127–128.

value of aids as *aids* is easily proved, and has been convincingly proved, by comparing the results of using aids with and without previous preparation.[3]

The audio-visual movement is not concerned only with motion pictures, either silent or sound. Once invented, the motion picture developed with amazing rapidity, and it was but natural that reflections and adaptations of its commercialized form should appear in various kinds of instructional activities. And apparently, it was just about as natural for many individuals to think of it and audio-visual education as being synonymous. The motion picture is one of the most spectacular, popular, and important of the audio-visual aids, but a glance at the list on page 14 should immediately convince anyone that it is by no means the only one.

Audio-visual instruction is not mere entertainment. Sad to relate, there are still teachers and administrators who believe in discipline and maintain that the more difficult and distasteful schoolwork is, the more educative it is. These individuals are either ignorant of, or out of sympathy with, modern educational philosophy and psychology, both of which stress the vital part interest plays in learning. The extreme disciplinarian (the "hard marker") tends to rate her success not by the extent to which her pupils learn but by the extent to which they do not learn, and her index of success is the proportion of high marks that she does not give.

To this teacher any device or procedure that is designed to lessen learning difficulties or make schoolwork more intriguing represents "soft pedagogy," entertainment and not education. Perhaps, in one way, this attitude is somewhat easy to take, especially in the case of aids that closely resemble, or are adaptations of, commercialized diversions such as dramatics, motion pictures, and trips.[4] But, as will be pointed out in detail later, audio-visual aids are not designed to amuse the pupil but to increase his interest in, and his comprehension of, the topic being studied by presenting several different slants on it, especially through his two most used senses—sight and hearing. In no way are they "cheap tricks to kid the pupils into learning," as one teacher of the old school described them.

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[3] See footnote, p. 24, on investigational and research studies.

[4] See the footnote reference to the term "excursion" on p. 246. The slogan of the motion picture industry, "Motion pictures are your best entertainment," has undoubtedly helped to delay the complete acceptance of motion pictures as educational devices.

Audio-visual instruction was not invented by the armed services of the United States. During the last war our armed services faced the urgent and perplexing problem of taking millions of young men and women with all types of background, mentality, and ability out of their peacetime pursuits and educating them rapidly and efficiently for war. This program had to provide a maximum of training in a minimum amount of time. To a very considerable extent, therefore, these services organized their instructional programs around audio-visual

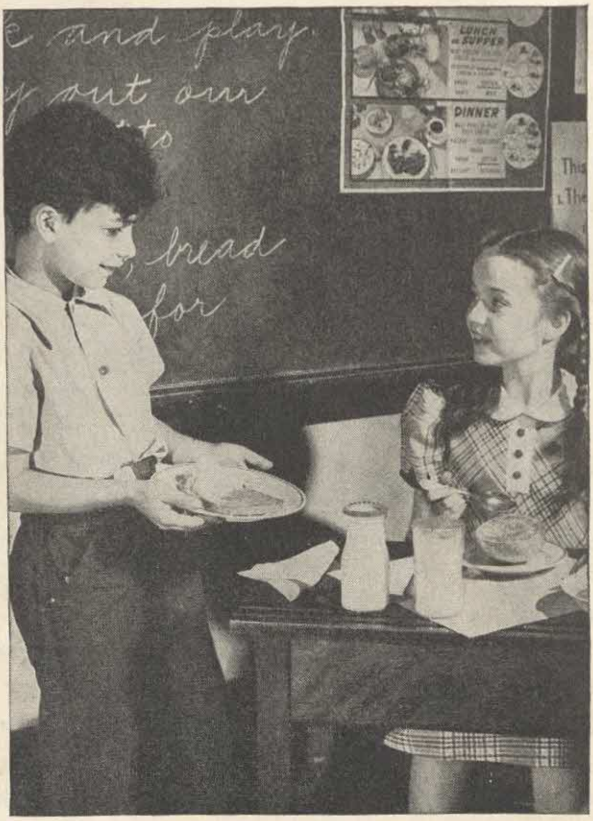

FIG. 2. These pupils are learning by firsthand experience what foods constitute a good breakfast. (*Courtesy of American Red Cross.*)

aids.[5] Since they had brilliant success in solving this problem, audio-visual instruction soon became known as the "G.I. way." [6] In one way this designation was but natural, not only because of the very extensive use made of these aids, but also because many of the men and women who were taught through these devices had had relatively little experience with them in their previous schooling.

Once the instructional achievements of the armed services were recognized and appreciated, this question was immediately raised in articles, addresses, and discussions, "Why cannot the schools teach the G.I. way?" Some enthusiastic educational critics even held that such teaching would decrease the present elementary and secondary school periods by several years. However, these critics failed to realize that the settings were quite different. In the armed services setting (1) goals were narrow and definite, and hence instruction could be concentrated and very specific; (2) although war purposes, materials, and routines were constantly changing, the corresponding teaching content and methods could be, and were, altered immediately to reflect them; (3) classes were small and instruction was highly individualized; (4) learning was vitally motivated; (5) instructors were carefully selected and thoroughly trained; and (6) unlimited financial support was available.[7]

Moreover, it must be remembered that the majority of men organizing and directing this audio-visual program for the armed services were those who had been organizing and directing the same general type of program in our universities, colleges, and public schools and constituted the best professional leadership available. The plan was developed by school people. Quite obviously it represented a marvelous opportunity for them, and they made the most of it. All honor to them and to the officials who gave them free rein in putting their theories into practice!

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[5] During the war the armed services purchased 55,000 projectors and spent $100,000,000 for training films.

[6] When Hitler was asked in 1939 to name the *Reich's* most important new weapon, he replied, "My 60,000 motion picture projectors." Following the German surrender in 1945, William Keitel, Chief of the German General Staff, said, "We had everything calculated perfectly except the speed with which America was able to train its people for war. Our major miscalculation was in underestimating their quick and complete mastery of film education."

[7] See "Audio-visual Aids in the Armed Services," by John R. Miles and Charles R. Spain, published by the American Council on Education, Washington, D.C., 1947. Chapter V is entitled Implications for Civilian Education. T. J. Abernethy concludes his article, A High School Principal's View of Army Training Methods (*School Review,* vol. LIII, March, 1945, pp. 142–147), with this statement, "Army instructors are not miracle men; they are sound practitioners in a favorable learning situation."

This discussion is not presented to reflect any petty jealousy of peacetime promoters of audio-visual instruction because there is no such jealousy. On the contrary, all the workers in this field were delighted at the success of the military and naval program and with the publicity that followed. This point is discussed for accuracy's sake—to correct a very common misapprehension. Audio-visual instruction is not synonymous with the G.I. way. As will be shown in the following section, these aids were in use long before the G.I.'s were ever heard of.

Audio-visual instruction is not new. Although the expressions "visual education," "visual instruction," "visual aids," and "audio-visual instruction," "audio-visual aids," "audio-visual training aids," "multisensory aids," and "visual-sensory aids" are of recent origin as far as professional literature is concerned, the method involved is very, very old. In fact, because it is both simple and natural, it is probably the oldest method of conveying ideas. Primitive man certainly learned to convey his thoughts by signs, gestures, facial expressions, and crude imitations long before he developed a vocabulary with which to express them orally. Primitive youths were doubtless taught to hunt, fish, swim, and protect themselves from enemies and the weather through observation and imitation. Later came hieroglyphics or picture writing and, centuries later, the many and varied forms of early alphabets that found their way successfully onto clay tablets and papyrus. Incidentally, the farther away expression got from the earlier and simpler forms, the more abstract and difficult to understand it became.

Perhaps primitive man played with hand-shadow silhouettes on the walls of his cave. At least we do know that shadow pictures and puppets have been used by the Orientals for thousands of years in providing entertainment and religious and tribal instruction. There is a record of how, about 1000 B.C., Emperor Muh of China staged several puppet shows for his friends and then angrily dismissed the troupe in disgrace because he claimed the puppets were too much in-

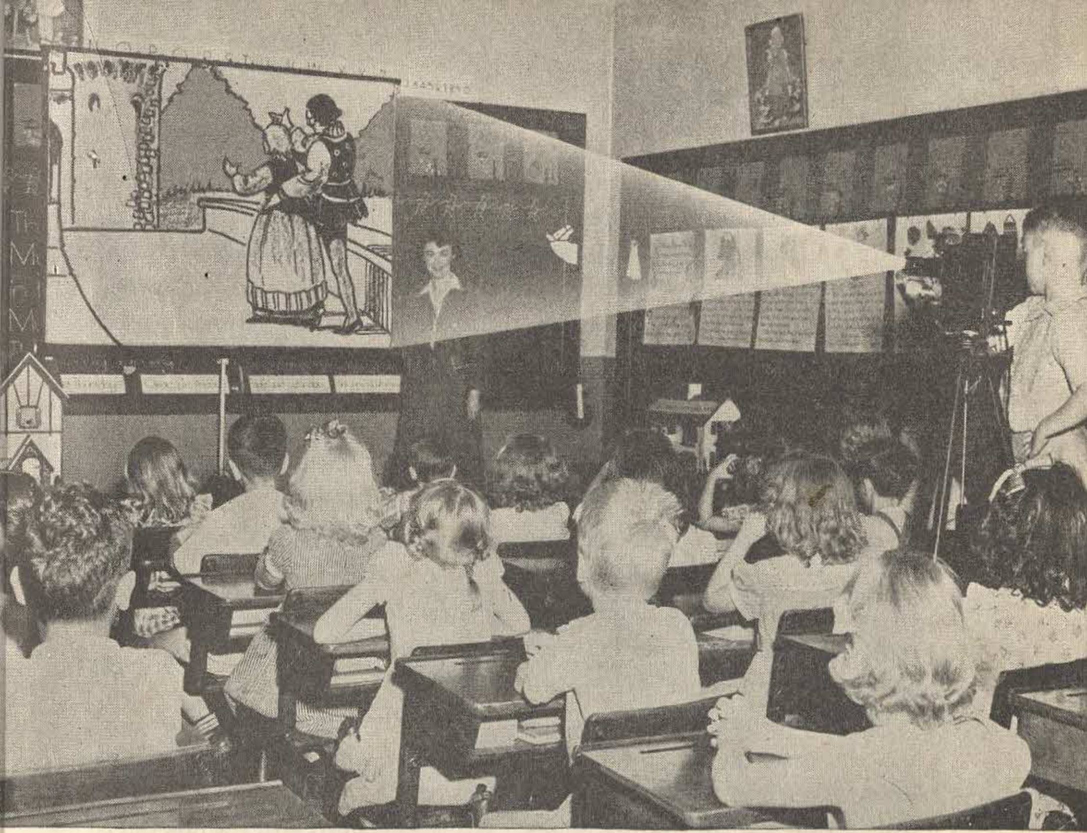

FIG. 3. "Visual aids" means more than slides and motion pictures, even though these are very important. In this picture are six other types of aids—models, objects, blackboards, flat pictures, posters, and illustrations. (*Society for Visual Education, Inc.*)

terested in his ladies. Dolls and doll clothing, models of animal pets, toys, and similar objects have been recovered from many tombs of antiquity.

The sculptures, stained glass representations, and paintings of the cathedrals of the Middle Ages were instructional in purpose. Each one told a story at a time when books were scarce and few could read. The magic lantern, predecessor of several types of modern audio-visual apparatus, is usually attributed to Kircher who described it in a book published in 1646. Nearly two centuries ago the British Museum encouraged the "people, teachers, and children" to use its collections.

Even in more formalized education visual aids have been used for centuries. Sand, boards, and slate, on which marks were made and diagrams were drawn, were the precursors of the modern blackboard. Real objects and specimens have always been used to illustrate and inform. Trips were common in the ancient Greek schools, and these and other aids were recommended and used by Erasmus, Pestalozzi, Rousseau, Froebel, William Penn, Benjamin Franklin, Horace Mann, and many other great thinkers, educators, and leaders. In the seventeenth century Pierre Nicole, the distinguished French Jansenist, used maps, pictures, globes, and flash cards for a number of years in his "little school" for boys at Port Royal.

Centuries before printing was invented, important manuscripts were "illuminated," that is, decorated, usually in color, with artistic designs. Although, originally, few or none of these decorations were planned to assist the reader in understanding the text, by the time printing appeared, there was a decided trend in this direction. Some of the later manuscripts were illuminated by means of woodcuts, which were perfected and used long before the invention of movable type.

Comenius's famous "Orbis Pictus," published in 1658, is usually given as the first example of illustrated printed books. It probably was the first illustrated textbook for children, and certainly the best known, yet printed books for at least a century and a half previously had included maps and drawings. By a few years after Comenius's time the majority of the new books in geography, history, science, and pedagogy were illustrated. Doubtless the reader has seen reproductions of some of the early maps realistically decorated with ships, dragons, great fish, animals, winds, stars, sun, moon, trees, mountains, human beings, and so on. Books on natural philosophy (science, especially physics) included explained illustrations of phenomena, principles, and utilizations. In 1690 appeared our own celebrated "New England Primer," an illustrated schoolbook which was used for more than a hundred years.

Of course, with the invention of photography by Niepce and Daguerre in the early part of the nineteenth century, the development of modern engraving and printing processes, and special types of paper, the possibilities of utilizing illustrative materials in books and other forms of publications for classroom purposes have multiplied many times.[8]

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[8] Two interesting recent developments are the microfilm book, reproduced on a small film and read from a translucent screen (see p. 166), and the "talking book," which is listened to, not read.

In summary, while the ancients knew nothing about the electric map, opaque projector, motion picture, filmstrip, radio, or record player, they at least knew the value of the original and basic forms of audio-visual aid.

Perhaps from the above negative discussion a positive definition of audio-visual aid is apparent. In the oft-quoted words of Dorris, "Visual instruction simply means the presentation of knowledge to be gained through the 'seeing experience.' "[9] According to Roberts, "Visual education is a method of imparting information which is based upon the psychological principle that one has a better conception of the thing he sees than of the thing he reads about or hears discussed."[10] And Dent defines visual-sensory aids as "all materials used in the class-

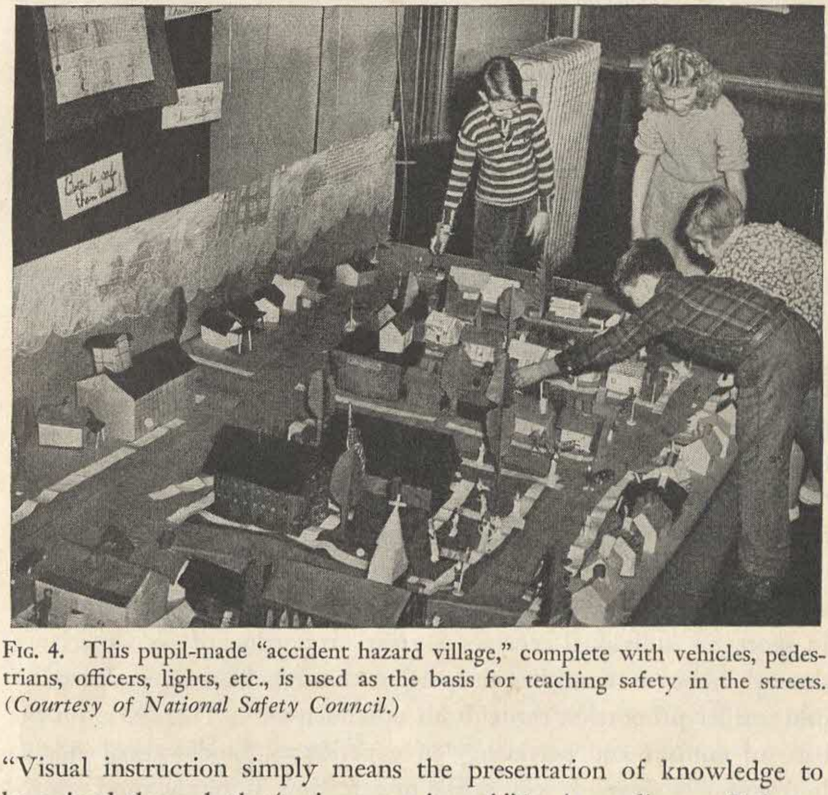

FIG. 4. This pupil-made "accident hazard village," complete with vehicles, pedestrians, officers, lights, etc., is used as the basis for teaching safety in the streets. (*Courtesy of National Safety Council.*)

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[9] A. V. Dorris, "Visual Instruction in the Public Schools," p. 6, Ginn & Company, Boston, 1928.

[10] A. B. Roberts, An Introduction to Visual Aids, *School Activities*, vol. 10, pp. 212–214, 221, January, 1939.

room, or in other teaching situations, to facilitate the understanding of the written or spoken word."[11] In short, these aids are supplementary devices by which the teacher, through the utilization of more than one sensory channel, helps to clarify, establish, and correlate accurate concepts, interpretations, and appreciations.

The expressions "visual education" and "visual instruction" have serious limitations. Nearly all forms of dramatics, for instance, bring both a visual and an auditory experience, as does also a transcribed description of an object, explanation of a graph, or discussion of a music program. Sound films, radio programs, and phonograph records have broadened the original narrower conception of visual instruction.

The expression "audio instruction" cannot be used accurately to designate auditory aids because it includes every word spoken by a teacher in an educational setting, whereas the latter expression refers more particularly to the newer devices suggested above—sound films, radio programs, and phonograph records.

Further, touch, taste, and smell can also be classified as channels for instructional aids. Touch in certain kinds of shopwork, taste in cooking, and smell in chemistry assist in the same way as visual and auditory experiences in these and other subjects. Perhaps "sensory aids," or "aids to perceptual learning," as Hollinger suggests,[12] might be a more accurate term than any of the other expressions used. However, the average learner uses touch, taste, and smell infrequently, and hence they represent but a relatively small part of his sensory experiencing. In short, an individual receives a great proportion of his experience through his eyes, a smaller proportion through his ears, and a great deal smaller proportion through his other senses.[13] Therefore, on the basis of number and pertinency of experiences, "audio-visual aids to instruction" appears, at least at the present time, to be the most appropriate expression so far suggested. "Visual aids" is too limited in scope, and "sensory aids" is too inclusive. Because of the practical necessity for a compact and easily recognized expression, the authors will use the somewhat inaccurate "audio-visual instruction" and "audio-visual education" to mean "audio-visual aids to instruction."

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[11] E. C. Dent, "The Audio-visual Handbook" (rev. ed.), p. 1, Society for Visual Education, Inc., Chicago, 1946.

[12] See J. A. Hollinger, Perceptual Learning, *Educational Screen*, vol. 19, pp. 49–50, 74, February, 1940.

[13] G. Carl Weller has interestingly pointed out (*Educational Screen*, vol. 15, p. 244, October, 1936) that in the Bible the word "nose" occurs 12 times; "skin," about 100; "tongue" or "tongues," about 200; "ear" or "ears," approximately 250; and "eye" or "eyes," about 550 times.

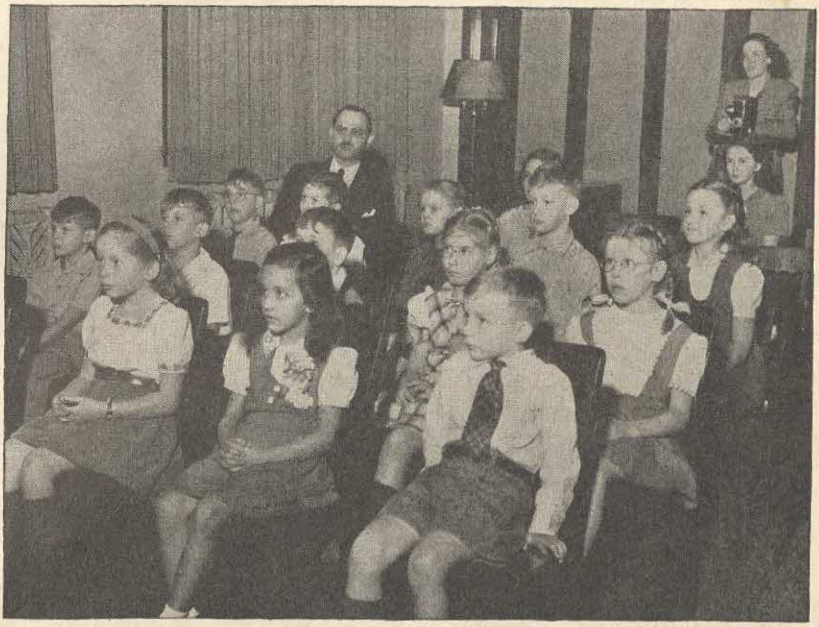

FIG. 5. That a picture on the screen means focused attention is evidenced by the faces of these primary church group youngsters. (*Educational Screen.*)

Even though in general it is possible to recognize what sensory channels are, on the basis of use, most important, it would be difficult to isolate and distinguish the contributions of each in cases where several are being utilized. Consequently, any discussion that distinctly and completely separates them is certain to be inaccurate. But here again the practical problem of presenting them clearly necessitates such distinction and discussion.

TYPES OF AUDIO-VISUAL AID

The most commonly used types of audio-visual aid are those listed on page 14. Although these may be classified in a number of different ways,[14] the classification used is satisfactory for our purpose here, which is merely to indicate the extent of the field. No importance should be attached to the order of these groups; it is alphabetical only.

- Blackboard and bulletin board
- Charts: table, stream and tree, and organization or flow
- Dramatics: pantomime, playlet, pageant, puppet show, shadow play
- Flat pictures: photographs, prints, and post cards
- Graphs: pictorial statistics, bar, area, line, diagram
- Maps: flat, relief, projection, electric, globe
- Models, objects, and specimens
- Motion pictures: silent and sound
- Phonographs, record players, and reproducers; records and transcriptions
- Posters, cartoons, and clippings
- Radio, AM and FM dictaphone and loud-speaker (classroom), public-address and intercommunicating systems
- Stereoscopes: hand and telebinocular, and stereographs
- Still pictures: flat photographs and prints
  - Projected: opaque and daylight, positive transparencies
    - Slides: glass, cellophane, filmstrip, ceramic
- Television equipment
- Trips, journeys, tours, and visits

AUDIO-VISUAL AIDS IN MODERN LIFE

Although, as was pointed out earlier in the chapter, visual and auditory aids have been used as vehicles of instruction from about the beginning of time, modern educational, commercial, professional, social, and recreational complexities brought a new demand. As a result of this demand, man's inventiveness has originated, developed, adapted, and applied them in many and varied forms. They are an essential part of our day-to-day living.

Consider for a moment how photographic, engraving, and reproducing processes have filled our books, magazines, newspapers, and other publications, as well as our bulletin boards and billboards, with pictures, cartoons, graphs, charts, and maps; how the science of display has made our stores and their windows, our museums, and our other exhibits more intriguing; how the microscope and telescope have revealed worlds that we did not know existed; how the stereograph and stereoscope have made pictures appear most natural by

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[14] For instance, these items might be classified into two groups as either equipment or aids. In such a grouping a phonograph would be classified as equipment and a phonograph record as an aid.

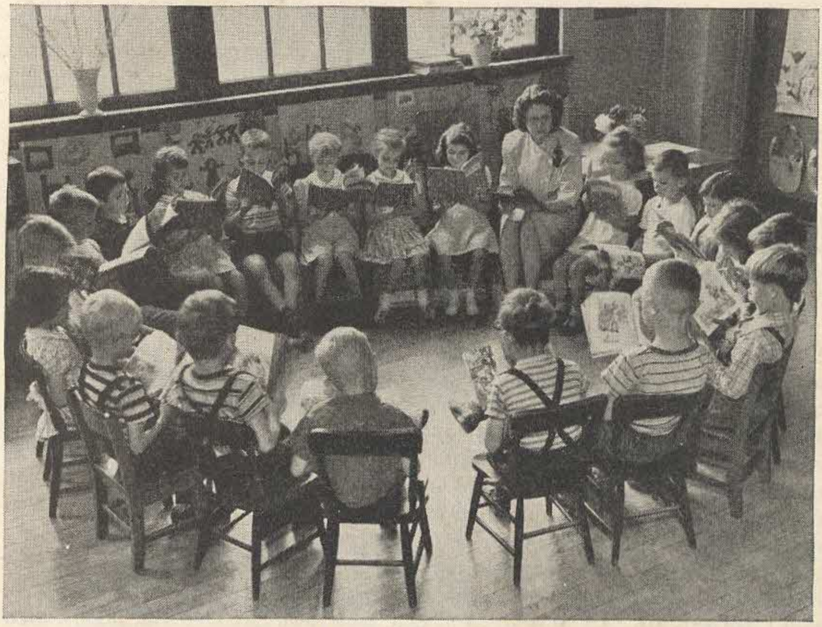

FIG. 6. Learning to read should be fun for these first-graders at the C. M. Bardwell School, Aurora, Ill. Note the attractive room, the informal circle, the illustrated reader, and the teacher as an interested member of the group.

giving the three-dimensional illusion; how exhibits have brought us customs, costumes, processes, practices, and products of other peoples and other times; how the radio, public-address system, and the record player have presented us with distant programs by unseen speakers, players, and musicians; how television promises soon to give us front seats at any world event; how trips—commercial, educational, and recreational—have deepened our interest in, and widened our knowledge of, other peoples, ages, and places; and how the motion picture has faithfully reproduced settings, scenes, actions, and processes representing the life, literature, and history of all parts of the world. All these devices through their accurate and vivid representation have exerted a tremendous influence in enlightening, in setting standards, and in giving widespread distribution to all types of ideas, processes, practices, and products.

AUDIO-VISUAL AIDS IN EDUCATION

The extent of the current interest in these devices is evidenced by their utilization for educational and training purposes in industry, commerce, trades, and professions; in all types of formal instruction—lower and higher, child and adult, public and private, general and specialized;[15] in recreational, and many types of public-supported camps;

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[15] According to Gayle Starnes (The Present Status of Teacher Training in the Use of Visual Aids, *Educational Screen,* December, 1937, and January, 1938), the first separate course in audio-visual aids was offered in North Carolina in 1921. In December, 1946, the Audio-Visual Education Committee of Western Illinois State College, Macomb, reported an investigation ("The Functions of an Audio-Visual Department in a Teacher Education Institution") which showed that out of 109 teacher-training institutions in the United States from which reports were collatable, 69 offered one or more courses in this field. One institution offered 10 courses; four, 4; eleven, 3; and the remainder 1 or 2 courses each. C. R. Crakes estimated that in 1947 about 182 institutions offered courses in this field. During the summer of 1947, 303 colleges and universities offered these courses. Although no statistics are available, probably a fair guess would be that about one-third of the 1,200 teacher-training institutions of the country now offer such a course.

Dr. de Kieffer (see below) reported in 1948 that 36 out of 56 active members of the National University Extension Association (65 members) reported audio-visual departments employing 228 full-time personnel. In 1947, the Illinois State Department of Education conducted half-day and evening programs in 37 workshop and demonstration centers. A good description of the workshop technique will be found in "Report of the Audio-Visual Education Administrative Workshop," Division of Audio-Visual Education of the State Department of Education, Sacramento, Calif., 1948.

Pennsylvania has for several years required its teachers to take a course in this field, and California requires a two-credit course or its equivalent in workshops. Maryland and a number of other states accept such a course toward certification.

In one way this picture may be a bit discouraging, but in another way it is encouraging because not one of these institutions offered such a course or workshop in 1920.

In 1947 the McGraw-Hill Book Company, New York, released a series of five motion pictures to be used for teachers' training. Accompanying each of the films is a filmstrip consisting of "stills" taken from the motion picture with pertinent questions appearing on each frame. These filmstrips make it possible to discuss the pictures for as long as the members of a viewing group wish to comment on particular episodes.

Probably the most complete investigation of teacher-training is the doctoral in the armed services, social and religious activities;[16] by their reflection in books,[17] magazines,[18] departments of professional journals,[19] bulletins, newspapers, and other publications; by the number of departments and sections of local, state,[20] and national educational associations and organizations;[21] by the many investigations, researches, and surveys centering around them;[22] and by the appearance of such

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dissertation of Robert E. de Kieffer, "The Status of Teacher-Training in Audio-Visual Education in the Forty-eight States," University of Iowa, 1948. This dissertation is briefed, under the same title, in the April, 1948, *Bulletin* of the Research Division of the National Education Association.

[16] William S. Hockman's "Projected Visual Aids in the Church" is published by The Pilgrim Press, Boston, 1947. Both *Educational Screen* and *Audio-Visual Guide* include a Church Department.

[17] Ten years ago F. W. Dunn and E. Schneider reported that "Forty-five books are already available in visual education and educational films, and at least forty-four on educational implications of the theatrical film." *Education*, vol. 58, pp. 454–459, April, 1938. A glance through the Selected References of this book will indicate how the list of these references has been greatly increased.

[18] See the list on p. 580.

[19] Illustrative of these are the *Journal of the National Education Association, Nation's Schools, Social Studies, Scholastic, Social Education, School Executive, Education, The Instructor.* Many other magazines list and review educational films.

[20] Thirteen states now have what can easily be classified as a department of audio-visual instruction, and several others carry on a very creditable program through other departments or officials. New York is usually named as having the first department; it was organized in 1904 to distribute lantern slides. A report of a recent survey will be found in the February, 1948, *Bulletin* of the Research Division of the National Education Association, Audio-Visual Staff and Organization in State Departments of Education.

[21] A national organization for the promotion of the use of visual aids was formed in 1915, but it soon went out of existence. It was followed in a few years by the National Academy of Visual Instruction, which later merged with the Visual Instruction Department, now the Department of Audio-Visual Instruction of the National Education Association. The Department of Secondary Teachers of the National Education Association not only sponsors National Audio-Visual Education Week (usually the last week in October) but also presents materials and equipment to schools and school systems cited as doing outstanding work in audio-visual education, especially at the secondary level. In August, 1948, audio-visual conventions held in Chicago drew an attendance of more than sixteen hundred persons. Here, for the first time, the National Association of Visual Education Dealers, the Film Council of America, the Midwest Forum, and the Educational Film Library Association held their annual meetings together.

[22] Charles F. Hoban reported 57 researches done between 1915 and 1934. The Office of Education of the U.S. Department of the Interior added 46 more for the years 1934 to 1936. (See also footnote on p. 24.)

educational officers as supervisors, coordinators, and directors of audio-visual instruction.[23]

Further, many schools, and nearly all the larger systems, now have their own departments of visual instruction, and some of these have their own libraries.[24] Numerous schools now make use of the many public and private loan services, and some of the smaller schools are uniting to develop their own cooperative organization, each adding a few films to the general library every year.[25] Nearly all state universities have loan libraries. Several state departments of education have organized and established loan services, as have also a number of other state and Federal departments, bureaus, and divisions,[26] as well as public and private, local and national museums, galleries, and libraries, several of which offer training courses for teachers.

The phenomenal development of the use of audio-visual aids may be illustrated by data from two school systems,[27] Buffalo and Cleveland, shown on page 19.

During National Audio-Visual Education Week, October, 1948, The Department of Secondary School Teachers of The National Education Association made citations for audio-visual progress to 55 schools and colleges, giving each about $800 worth of new materials and equipment. Each of these was designated a "pilot" school to serve others in demonstrating related teaching methods.

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[23] In 1936 approximately four hundred schools and systems in the United States employed full-time or part-time directors of audio-visual instruction. The most recent list (1946) of full-time and part-time officers, published by the Department of Audio-Visual Instruction of the National Education Association, includes the names of 76 full-time and 663 part-time directors. In addition, 142 schools reported audio-visual activities but did not indicate either full-time or part-time designations. Probably all or nearly all of these could be classed in one of the above groups. The American Council on Education recommends that there be a full-time director of audio-visual instruction in communities of 25,000 or more.

[24] Audio-Visual Education in City School Systems (*Research Bulletin,* vol. XXIV, no. 4, December, 1946, National Education Association) is a study of 1,037 school systems representing 11,193 different schools—three-fourths of which are elementary. This bulletin contains six chapters on audio-visual instruction in current educational plans—direction and supervision, use, equipment and materials, expenditures, and improving the program.

[25] See the discussion of county organization on p. 533.

[26] In the fall of 1947 a five-year program for the production and training in production of visual materials to be used for health-education purposes was established at Tulane University.

[27] For similar reports on 14 school systems see We Are Today Spending, and See & Hear Surveys Audio-visual Budgets, *See & Hear,* vol. 4, pp. 18–19, October, 1948, and pp. 15–17, December, 1948.

Audio-Visual Equipment, Buffalo *

Year	*Reels of 16-mm. silent film*	*16-mm. sound film subjects*	*16-mm. silent machines*	*16-mm. sound machines*
1940–1941	1,086	49	97	16
1946–1947	1,900	449	105	77

Circulation of Visual Aids

Year	*16-mm. silent film*	*16-mm. sound film*	*Bd. of Ed. mounted pictures*	*Bd. of Ed. slides*
1940–1941	15,687	712	12,783	263,201
1946–1947	29,461	7,108	48,972	331,335

* From the "Annual Report of the Visual Aids Division" of the Buffalo Board of Education, prepared by Alan H. Nicol, Supervisor of Visual Education. Owing to lack of space, only certain items from this report are included here. During 1946–1947 this staff was composed of 11 full-time employees, and the budget was $31,474.85.

In 1929–1930 no 16-mm. films were used in the Buffalo schools; in 1937–1938, 14,605 were shown, and as shown above, in 1946–1947, 36,569 (both silent and sound) were used.

Audio-Visual Equipment, Cleveland *

Year	*Sets of slides*	*Silent films*	*Sound films*	*Film-strips*	*16-mm. projectors*	*Screens*
1938	8,769	1,040	250	40	96	48
1948	8,965	1,187	2,146	4,063	165	93

* This information was supplied by Leslie E. Frye, Director, Division of Visual Education.

The following tables, showing the first six items from the listings in three studies on "The Availability of Educational Sound Films from Midwest City Schools Audio-Visual Departments," May, 1948, will give some indication of the extent to which this type of aid is used in one part of the country.[28]

City	*Population*	*Prints*	*Teachers*	*Ratio*
Hibbing, Minn.	16,385	400	200	2.00
St. Louis, Mo.	816,048	3,500	2,425	1.44
New Albany, Ind.	25,414	125	150	0.833
Chicago, Ill.	3,396,808	10,000	12,662	0.789
Muskegon Heights, Mich.	16,047	100	127	0.787
Dayton, Ohio	210,718	800	1,050	0.76

Educational Sound Films in State and University Film Libraries

Institution	*Number of Prints*
Ohio Film and Slide Exchange	12,000
University of Indiana	7,500
University of Wisconsin	7,000
University of Illinois	4,000
University of Michigan	3,700
University of Minnesota	3,000

Educational Sound Films per 1,000 Population in Middle Western States

State	*Population*	*Ratio*
Indiana	3,427,796	2.59
Wisconsin	3,137,587	2.47
Ohio	6,907,612	2.30
Iowa	2,538,268	2.00
Illinois	7,897,241	1.86
Nebraska	1,315,834	1.69

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[28] These data were compiled from "The Audio-Visual Directory" by Joseph E. Dickman.

In 1938 there were 458 sound projectors in American schools. In 1948, according to the estimate used by the U.S. Office of Education, there were approximately 35,000.

Minimum standards in equipment, as established by competent educators, offer additional evidence of the importance of this field. For example, the Committee on Visual Aids of the American Council on Education recommends as follows: [29]

1. One 16-mm. sound projector for every 200 students
2. One filmstrip projector for every 200 students
3. One 2″ x 2″ projector for every 400 students
4. One 3¼″ x 3¼″ projector for every 400 students
5. One set of 35 stereoscopes for every 400 students (elementary schools only)
6. One opaque projector for each school
7. One table-type radio for each classroom
8. One two-speed portable 16-in. transcription player (complete with speaker) for each 200 students
9. One microphone for use with playback or projector for each school
10. Wall-type screens or suitable projection surface for each classroom

Where the enrollment is less than the above specified number, one piece of equipment per building is recommended.[30]

From this brief discussion it will be seen that modern audio-visual instruction is not a fad or a frill but a most significant educational development. On the other hand, despite its phenomenal growth, it is not yet fully developed. A great deal of investigational experimentation still needs to be done in order to perfect machines, devices, and materials to make them easily available, to train their users, to educate those who must provide and maintain them, and to

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[29] H. Seaton, "A Measure for Audio-Visual Programs in Schools," p. 36, American Council on Education, Washington, D.C., 1944. See also pp. 542–546 and footnote, p. 575.

[30] The American Council of Education in its publication "The Motion Picture in Education" (series II, vol. 1, April, 1937) judges the status of films in education by means of seven indexes: (1) the quantity of projection equipment in the public schools; (2) the production activities of the schools; (3) the commercial production of films for education; (4) the quantity of films owned by schools and school districts; (5) the growth of circulating film libraries; (6) the number of districts employing full-time and part-time directors of visual instruction; and (7) the extent of teacher training in the use of motion pictures and other materials.

Accession No. 1003

develop well-balanced programs for schools. Judging by the present indications, all this will be accomplished.

Undoubtedly, too, in spite of the often heard (but quite absurd) statement, "The sound film is the acme of perfection," adaptations and improvements of this and other commonly used devices will be made and new ones will be invented. For instance, television,[31] the microbook and the talking book and stereophonic or three-dimensional sound have already been suggested as probable future developments in this program. With so many competent individuals working on the problems involved and with so much capital financing these developments audio-visual instruction of tomorrow will undoubtedly represent a great improvement over that of today. The outlook is most promising. Surely all of us who are interested in this future development really envy the educational opportunities of the boys and girls of a generation or two hence.

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[31] Piano lessons have already been televised (see footnote, p. 307).

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THE FUNCTIONS OF AUDIO-VISUAL AIDS IN LEARNING

Comparatively little space will be devoted to a theoretical or scientific justification of audio-visual aids because the main emphasis of this volume is on the realistic ways in which they may be effectively used.[1] For the average, practical-minded teacher or administrator an extended and detailed support of them is not necessary. The wide use made of these devices in industry and the present great movement to capitalize on them in our formal educational affairs represent sufficient evidence that they have been accepted as valuable. However, a brief, simple, and nontechnical examination of the place and contribution of these aids will serve as an appropriate foundation upon which the later detailed presentations may be built.

THE CHANGING EMPHASIS IN FORMAL EDUCATION

There is no more reason to expect formal education to remain static than there is to expect the society of which it is a part to remain static. It is almost trite to remark that any changes in an educational system or plan are but the result of alterations in its component parts. Some of its elements may be increasingly or decreasingly emphasized, some may be entirely eliminated, and some new elements may be originated, developed, and introduced. The significance of these elements is always relative, depending upon the conditions of adult society. A short discussion of (1) the main basic difference between the child and the adult, (2) the recent important changes in American society, and (3) the educational implications of the changes will show the reasons for the great present interest in audio-visual instruction and thus set the stage for a consideration of the contributions of these aids.

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[1] Chapter X of the "Thirteenth Yearbook" of the Department of Elementary School Principals, 1934, includes a great deal of the earlier experimental evidence of the effectiveness of audio-visual aids. The October, 1931, and October, 1933, numbers of the *Review of Educational Research* summarize a number of evaluative articles on related teaching methods. Summaries of more recent research will be found in the June, 1942, and June, 1945, issues of this same magazine. The U.S. Office of Education, Washington, D.C., is now analyzing research in this field and will within the next few months publish a special bulletin on the subject.

The basic difference between the child and the adult. The greatest difference between the child and the adult is not in size, height, or weight—some children are larger, taller, and heavier than some adults. Nor is it a difference in amount of book knowledge or I.Q.—some children know more facts and have higher I.Q.'s than their parents. Generally speaking, the main difference between the child and the adult is in maturity; the adult is more mature, not always, but usually, than the child. And the adult is more mature because he has had more experience (from *expereri* "to try out") with things, people, places, events, ideas, and relationships—all of which are educative influences, even though many of them are not classed as, or included in, "education" as it is usually understood. The greater the number of these experiences, the more desirable they are; and the more wholesome the reactions caused by them, the more educated or mature is the individual. In short, profitable experiences add to maturity and social intelligence; they result in real adulthood.

In a simple social organization there are relatively few of these experiencing opportunities, they are not particularly difficult to capitalize, and, therefore, maturity comes relatively quickly and easily. In primitive times the youth completed his mastery of the implements and methods of hunting, fishing, fighting, and protecting himself from the weather and became a "man" at about the time of adolescence. Conversely, in a highly organized and complex society there are a great many of these possibilities, and, consequently, maturation is slower and more labored. Continuously changing purposes, materials, and routines bring new experiences and a demand for new forms of preparation and capitalization.

How is education concerned? In Colonial times the community was small, its activities and relationships were comparatively simple, and individual differences were relatively few because opportunities for their expression were relatively few. Hence the individual soon learned by firsthand experience almost all the things he needed to know in order to fit successfully into his particular group. He went to school, but here he learned the three R's and little else. The remainder of his "education" was supplied by the school of community life. But all this education was simple, and the individual completed it in a relatively short period of time.

FIG. 1. These Garret Park, Md., pupils are checking routes by which their Christmas Decoration Units will go to American troops overseas and to hospitalized servicemen in this country. (*Courtesy of American Red Cross.*)

As population increased, society in all its phases grew more complex, conflicting interests and demands arose because of the greater number of experiencing possibilities open to the individual, individual differences multiplied because opportunities for their expression multiplied, and completing one's education became a longer and more troublesome process. A great deal more social intelligence is required in a modern society than in Colonial times, more in quantity, more in variety of elements, and more in quality.

As a result of this increased complexity, society and its school drifted apart, or more accurately, society drew away from the school. In an earlier day the school supplied the practical fundamentals required for successful entrance into simple community life, but later in its philosophy, materials, and methods it became self-centered and academic—more interested in "passing on the noble heritage" than in developing wholesome citizenship. No longer was it immediately practical, especially in the upper grades after the secondary school appeared and developed with amazing rapidity. This "people's college," dominated directly and indirectly by the college through teachers, teaching, materials, entrance requirements, and the like, went off on a tangent chasing an educational will-o'-the-wisp commonly known as "culture," which always has been, and still is, being chased madly by most "colleges of liberal arts."

A very significant weakness of traditional education (and still of much of liberal arts education) was its tacit assumption that what was being taught was more important than those who learned it. This notion of education was also due to the close school-church alliance and to the church's conception that the sacred things in religion were the books, materials, equipment, procedures, and so on, instead of its communicants. The intelligent educator of today holds that the pupil is the most sacred thing about the school and that the various educational materials, equipment, and methods are but the tools with which the pupil is to be developed and improved. He recognizes that his tools must be kept sharp, in good repair, complete in number and appropriate in type and that new and improved ones must be added as they appear or become necessary. But his main interest is in his pupils, not in his tools.

As was suggested in the previous chapter, modern society is now demanding in no uncertain terms that any and all formal education for which it pays not only contribute very definitely to wholesome social living but contribute in sufficient quantity to represent a good investment of the funds expended for it. Increasingly, the community is insisting that the school train the pupil to understand societal relationships, appreciate his own responsibility, and discharge that responsibility in at least a somewhat creditable fashion. It recognizes that successful training is concerned with the physical, social, spiritual, and vocational phases of life as well as with the mental. To the community the wholesome and contributing citizen and not the scholar, the valedictorian, or the honor student is the earmark of successful schooling. In short, modern society is demanding a functioning school, a school with more justifiable objectives, more pertinent and relevant materials, and greater efficiency in general instructional procedures.[2]

How is maturity concerned? Obviously, there are too many possible and essential experiences in the modern world for anyone to have them all in their original form. Some of these are impossible to obtain directly, some of them are too expensive, and many of them vary in relative worth. An individual could never "start from scratch" and acquire his experience as the race acquired it. Consequently, the school is charged with the responsibility of selecting the most important and desirable of these experiences, of classifying and emphasizing them properly, and of then setting the stage in order that the pupil can have them—naturally, most of them vicariously.[3]

The child, of course, has had very little experience with the world about him. As a learner in becoming acquainted with it, he must not only master a bewildering number of facts, concepts, and relationships but he must also coordinate these in such a way that they represent an organized and helpful outlook instead of a miscellany of unrelated and unusable items. They must be meaningful, and they must be functional. Further, because of the magnitude of the task, he must learn to do this mastering, coordinating, and utilizing economically with as little time and effort as possible. Just here is where audio-visual aids can give substantial assistance through their possibilities of motivation, clarification, and stimulation. As suggested before, never have these aids been more necessary than they are at present, and never have the opportunities for their utilization and further development been more propitious.

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[2] William Heard Kilpatrick's "Education for a Changing Civilization" (The Macmillan Company, New York, 1927) is still a very pertinent reference to this discussion. The first of the three lectures considers the industrial, technological, economic, and social changes that have occurred; the second shows the implications of these for education; and the third lecture points out what the schools have already accomplished in adapting themselves to these changes.

[3] John Dewey's book, "Experience and Education" (The Macmillan Company, New York, 1938), analyzes the viewpoints of "traditional" and "progressive" education. As suggested by the title of the final chapter, Experience—the Means and Goal of Education, Dewey defines education as being of, by, and for experience.

MOTIVATION

Largely because of the very close relationship of the church and the school in an earlier day, that very old religious philosophy, "What is good for the body is bad for the soul, and what is bad for the body is good for the soul," has influenced our American education for many years. This philosophy emphasized that the discipline accomplished through the doing of distasteful tasks was of prime importance, and this was reflected in "discipline," "hard work," "spare the rod and spoil the child," "you don't like it, but it's good for you," and similar expressions and attitudes. It was more or less firmly established in the minds of nearly all parents and teachers. Even today many such individuals consider any attempt to veer away from this philosophy a cheap, undignified, and unworthy pampering of the child.

Owing to the labors of the great thinkers who recognized the vital place interest plays in all of man's activities, in this country principally to the efforts of Dewey and his interpreters, education entered a new era, the slogan of which is "Discover and capitalize child interests." Naturally, this emphasis implied a recognition of individual differences because it was perfectly logical to assume, even without research and experimentation, that individuals do not have the same interests, the same degree of intensity of interest even if they are attracted to the same thing, or the same combinations of interests. Thus, this pair—child interest and individual differences—very profoundly changed our educational organization, materials, and techniques.

Extrinsic motivation. One of the resulting changes was a newer conception of motivation, which means literally "to move." Formerly, motivation was largely extrinsic, both negative and positive.[4] In the negative type the pupil was compelled to do a particular task through punishment or penalty (or fear of them) in a variety of forms. Parents, teachers, and religious leaders did not recognize that forcing a child to perform some unpleasant task results in a dissipation of his mental, emotional, and, often, physical energies in rebelling against such coercion, in pretending to be interested, or in devising ways and means of doing the job just to the point of "getting by." Of course, such forced learning represents a depressing and therefore a discouraging and handicapping setting.[5] And the results are certain to be meager and barren.

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[4] Chapter XIII of H. C. McKown's "Character Education" (McGraw-Hill Book Company, Inc., New York, 1935) is an evaluative discussion of extrinsic and intrinsic motivation. See also H. B. Wilson and G. M. Wilson, "The Motivation of School Work," Houghton Mifflin Company, Boston, 1921.

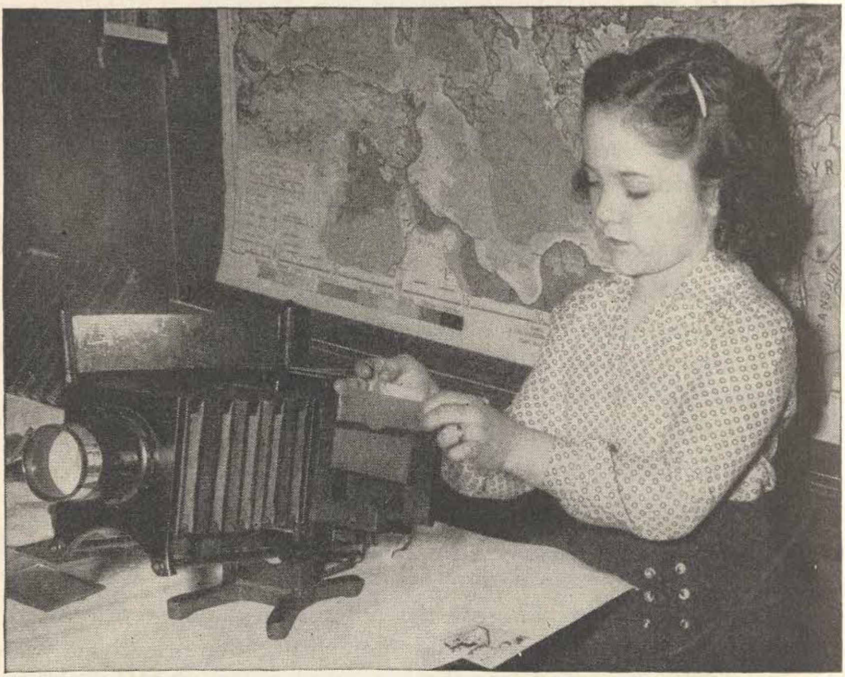

FIG. 2. This young lady not only makes slides suitable for instructional purposes but also operates the projector. (*Courtesy of Youngstown, Ohio, Public Schools.*)

In the positive type of extrinsic motivation the pupil was encouraged to do good schoolwork by such devices as marks, prizes, privileges, honors, and other special recognitions. Here parents, teachers, and religious leaders did not appreciate that when the pupil works with some reward in mind he is dividing his attention between the task and the prize, and moreover, he is not recognizing sufficiently that the task itself is the most important element in the picture. As in the case above, he is not practicing concentration. Hartshorne states very pertinently in this connection:

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[5] F. J. Keller, in "Day Schools for Young Workers" (p. 76, Appleton-Century-Crofts, Inc., New York, 1924), places the blame for school dropouts as follows: "Children leave school for complex reasons, but far the most important one is dislike for school, and dislike for school grows out of failure of the school to capture interest either because of immediate pleasurable qualities or potential values."

> There is increasing dissatisfaction with the reward system and less and less dependence upon it for motivation of activities. . . . Beads and coups and merit badges, dear as they are to the heart of a child, are hardly a substantial foundation for the motivation of life's purposes, and when a leader deliberately cultivates dependence upon such external awards, even though they have no intrinsic value, he helps to establish those self-seeking motives which gnaw at the vitals of our social order.[6]

Morrison, writing in this same vein on "Spurious Motivation," says, "The usual effect is at best casual, and in the majority of cases the removal of the stimulus removes the motivation as well."[7] The present trend toward the elimination of marks in curricular, and awards in extracurricular, activities shows that educators are fast losing confidence in their effectiveness as motivators.[8]

Intrinsic motivation. With the development of the psychology of learning came the doctrine of interest, which stresses the ideas that (1) the child has vital inherent interests and that (2) it is the business of education to discover, develop, and capitalize on these for beneficial ends.[9] The modern educator deliberately attempts to make his school into an intriguing setting, a place where the pupil will be wholesomely happy—and he does not do this in any cheap or pampering manner but in a dignified way on a high plane. He provides artistic buildings and grounds, curricular and extracurricular programs varied enough to appeal to all types and degrees of interest, and instructional materials and techniques that are useful and natural rather than academic and artificial. In this setting motivation is intrinsic not extrinsic. The pupil works, not to avoid punishment or for medals and glory, but for the personal satisfactions that come with accomplishment.[10] Note how he will voluntarily spend hours and hours in working on some project—a stamp collection, an airplane model, an original poem, or a debate or in practicing music, basketball, parliamentary procedure or dramatics—all because the activity intrigues him. He is spurred by an inner drive toward the achievement of ends within his own experience and comprehension.

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[6] H. Hartshorne, "Character in Human Relations," p. 39, Charles Scribner's Sons, New York, 1932.

[7] H. Morrison, "The Practice of Teaching in the Secondary School," p. 111, University of Chicago Press, Chicago, 1931.

[8] Two other references pertinent to this discussion are E. L. Thorndike's investigation-reporting monograph, "An Experimental Study of Awards," Teachers College, Columbia University, New York, 1934, and Carol Chen Shu-kuei's descriptive doctoral dissertation (the most complete study made of the use of these devices), "Honors and Awards in American High Schools," The Hillside Press, New York, 1933.

[9] The classic among the discussions of interest and effort is John Dewey's monograph, "Interest and Effort in Education," published in 1913 by Houghton Mifflin Company, Boston. All of it is pertinent to this section.

A worthy motive is an inducer, an inciter, or an impeller, and it is always based on interest. An interest does not necessarily result in a motive, but it is always the starting point. Through aggressiveness toward attainment interest develops into a motive. This point is very important and is worth emphasizing. Interest is not an end in itself, but rather a most important means to that ultimate end of growth and development. By creating a proper mental attitude or mind-set, interest guarantees attention and thus paves the way for "activity leading to further activity." If it does not result in this, it represents only a temporary diversion, a sort of entertainment. Interest developed to its highest degree spells reflective thinking.

Curiosity is the elementary form of interest, the "vestibule of interest." Its importance may be seen from four brief evaluations. Centuries ago Plato stated, "Curiosity is the mother of all knowledge," and later John Locke expressed the same idea in these words: "Curiosity in children Nature has provided to remove the ignorance they were born with." According to Kirkpatrick, "Curiosity in some form is daily and hourly a factor in human action and thought. . . . Curiosity, like play, may be the stimulus to an immense amount of what would otherwise be drudgery." [11] When curiosity becomes speculative, that is, when it begins to ponder relationships and ask the question "Why?" it becomes, as Charles H. Parkhurst happily defines it, "thought on its entering edge." Consequently, it is not to the credit of the traditional school that far too often it rebuffs and smothers the child's perfectly normal and desirable curiosity. Little wonder that such a school requires a most unusual array of devices to stimulate the pupil's attention.

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[10] One of William Penn's favorite quotations was, "He that does good for good's sake seeks neither praise nor reward, though sure of both at last."

[11] E. A. Kirkpatrick, "Fundamentals of Child Study," pp. 192, 201, The Macmillan Company, New York, 1917.

Just how are audio-visual aids concerned? Quite obviously sensory aids captivate interest, and they do this in several ways or for several reasons, the most important of which are the following:

Usually These Aids Are Novel. Sensory aids generally represent a rest from the traditional activities of the school, such as reading, computing, drawing, writing, reciting, or listening, that the pupil has been doing. When using them he is experiencing something different, and variety is always attractive to the child as well as to the adult.

Sensory Aids Allow Some Freedom from the Formal Restrictions of the Traditional Recitation. While using sensory aids, the pupils may move about, talk, laugh, question, comment upon, and in other ways act in a natural manner as they do outside the classroom. The teacher's attitude is not one of compulsion, "now-here-is-what-you-must-do," but rather a friendly and cooperative "let's-look-at-these" type. This conducive atmosphere helps to focus attention unhindered by undesirable emotional reactions. A quotation from Lowth is pertinent:

> Schoolwork is motivated when pupils work because they want to and not because the teacher asks them to do something. . . . We need to realize that the best work in the world today is really not done under compulsion, but rather from an inner impulse born of genuine interest, either immediate or remote. We cannot think of men like Edison or Lloyd-George or Ford as being driven to their tasks. They work because they love to work, because they have great purposes to realize and goals to reach. . . . Their work is the highest type of motivation. . . . The work of the school should be based on the needs of the children and appeal to and utilize their experiences, if it is to be well-motivated, interesting, and therefore successful.[12]

Sensory Aids Are Relatively Easy to Understand and Master Because They Are Concrete. If mastery is immediate, the pupil receives a genuine thrill of accomplishment and is thereby encouraged, but if it is delayed, his interest and attention tend to be discouraged. A verbal description of an object or process is difficult to understand because it represents a roundabout way of learning; the teacher must (1) completely see the object as to proper details, relationships, and

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[12] F. J. Lowth, "Everyday Problems of the Country Teacher," p. 454, The Macmillan Company, New York, 1927.

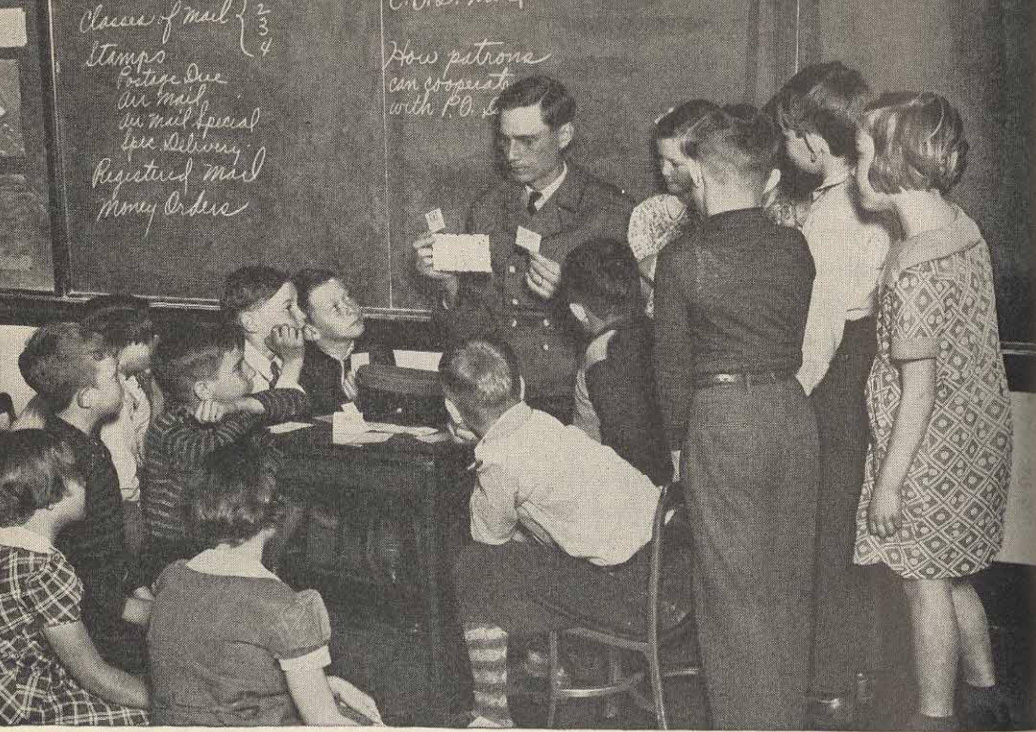

FIG. 3. Practical instruction from an outside teacher. Here postman Ovus Fuson is explaining the United States mail service to a group of Springfield, Mo., pupils. Note the pertinent topics on the blackboard.

perspective, (2) translate it into accurate and comprehendable symbols, and (3) pass these symbols along to the pupils, and they in turn (4) must then interpret and translate them back again. Obviously, there are many possibilities of error, misemphases, and misunderstanding in these four processes. When a pupil senses an object firsthand, his experiencing is not determined by his success in reading about or in listening to or by the extent of his vocabulary of symbols. He learns more rapidly, and his learning is more permanent when it is based on direct sensory contacts.

A good example may be found in commercial advertising. The advertiser shows an arresting photograph, drawing, or other illustration (often a beautiful and more or less scantily clad young woman), which is easily mastered. Once his attention is caught, it is easy for the viewer to read at least some of the text of the advertisement. Imagine how unintriguing this same advertisement would be if it consisted only of text material.

Sensory Aids Cause the Child Immediately to Focus His Entire Attention on Them. One cannot be too certain that while a child is reading, computing, writing, listening, or doing other traditional school tasks, he is giving 100 per cent attention to them. He may be giving them pretended attention. Physically he may be going through the motions while mentally he may be wool gathering. Suzzallo says, "The parent and the attendance officer . . . can guarantee only one thing—the physical presence of the child at school. It is left to the teacher to ensure his mental attendance by a sound appeal to his active interest. . . . It is altogether possible for the child to be present physically, yet absent mentally." [13] When a pupil is really experiencing a sensory aid, his attention is so intense that other things are excluded from his mind. He cannot successfully look at a motion picture, examine an object, operate a working model, or use a stereoscope and think about something else at the same time.

Many of the Aids Provide the Child with Opportunities to Handle and Manipulate. By original nature both children and adults are manipulators. All of us like to get our hands on novel and interesting objects because we all crave firsthand experience. We all have the "let-me-try-it" feeling. Thorndike has pointed out that although the child enjoys seeing his blocks tumble, he gets more pleasure out of knocking them down himself. Undoubtedly a great part of this manipulative trait is due to a desire for mastery and ownership. An opportunity to touch, feel, heft, handle, or operate a model, specimen, picture, map, stereograph, or other aid gives an added appeal because it satisfies, temporarily at least, this natural desire for mastery and ownership. A higher development of this trait is the manipulation of ideas and concepts. All types of manipulatory activity represent participation or self-activity, and this is not only always interesting but also essential to effective learning.

Sensory Aids Satisfy Immediate Curiosity. A child's curiosity about an aid may be only temporary, but even this curiosity is highly important because it is a starting point of interest. An aid fits nicely into the hole or lack in the setting which the pupil has recognized. In the words of Wilson, "The child's work is motivated whenever he sees a real use in it—whenever it satisfies some need he feels, provides some value he wants, supplies some control he wishes to possess, secures some desired end, or helps him to accomplish any definite goal." [14]

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[13] Editor's Introduction to Dewey, *op. cit.*, p. viii.

[14] Wilson and Wilson, *op. cit.*, p. 15.

The logical implication is that the teacher must prepare the setting in such a way that the pupil realizes a lack or need, which she will later fill or satisfy. In such a case the ultimate experiencing through the aid is all the more rich, meaningful, and satisfying to the pupil because of the anticipation that the teacher has developed in him.

An Aid Makes an Appeal Because It Does Not Satisfy Completely. This statement may appear to be paradoxical in the light of the above discussion, but it is true nevertheless. The pupil sees new items in a photograph, new relationships in a specimen, new possibilities in a model, or new objects or processes on a trip, and these bring new questions, problems, and implications and thus deepen and widen his interest. The more he sees, the more he wants to see. As was suggested previously, and as will be discussed more in detail later in the chapter, this stimulation to additional interest and activity represents a most important function of sensory aids.

In conclusion, then, modern educational theory recognizes the extreme importance of pupil interest. Quoting Thorndike again, "The problem of interest in teaching is not whether the children shall learn with interest or without it; they never learn without it; but what kind of interest it shall be; and from what the interest shall be derived."[15] Audio-visual aids, wisely selected and intelligently used, arouse and develop intense and beneficial interest and in this way motivate the pupil's learning. Properly motivated learning means improved attitudes, greater permanency of impressions, enriched experiences, and, ultimately, more wholesome living.

CLARIFICATION

Because the senses represent the only contacts between the individual and the world about him, intellectual activity depends, directly or indirectly, upon experiences that come through these channels. Even the internal reactions, the higher types of cerebration often designated by the general term "original thinking," and including such mental activities as concentration, reflection, conception, imagination, association, discrimination, and recollection have their basis in sensory experiences because the mind must have something to think about or play with; like the stomach, it works on what it is fed. This feeding comes through the senses.

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[15] E. L. Thorndike, "Principles of Teaching," p. 54, A. G. Seiler, New York, 1911.

The raw material for mental activity may come from three types of source: direct sensory experience with the original item—a fruit, landscape, or locomotive; direct sensory experience with representations or reproductions of the original item—a photograph, model, or drawing; and symbolic representations such as oral and written descriptions. All three of these sources are necessary. However, each has its particular specialized function and should be capitalized accordingly. Attempting to make all of them serve in the same setting or in the same way would be as stupid as attempting to drive a nail, saw a board, or turn down a screw with the same tool—a hammer, a saw, or a screw driver. A comparative description of the contribution of each will help to clarify its function and thus help to show the place of audio-visual aids. Because of its establishment in traditional educational procedures, the third type, symbolic representation, will be discussed first.

Symbolic representation. Under certain conditions and in certain settings symbolic representation or verbalism—the expressing or conveying of ideas through oral or written language—is very helpful and economical. A great deal of meaning can be crowded into a single short sentence, a sentence that summarizes a group of related past experiences. The one basic element that determines whether or not verbalism is economical is the extent of the commonness of knowledge or experience of the conveyer and the conveyee. A scientist might be able to describe the theory of the fourth dimension very accurately and still not be able to make himself understood because his hearers lacked sufficient information, insight, or background to comprehend it. If his hearers have this ability, the scientist's description would represent a very direct, accurate, and economical method of explaining the theory to them. Words, like money, are of value only if there is value behind them.

On the other hand, under certain other conditions and settings verbalism is very confusing and uneconomical. A great many sentences may be required to express clearly a single concept or idea. Verbalism can be cumbersome because the teacher must translate the original item accurately into symbols and pass these along to the pupils who then must retranslate them back into the original image. To repeat, these processes provide many opportunities for error, misemphasis, misinterpretation, and misunderstanding. Consider how difficult it would be for the average individual to get an idea of a minaret, the operation of some mechanical device, the shape and size of the various states of the Union, or the general details of Colonial dishes through merely hearing a discussion of them. As Weber states, "Verbalism is at best an indirect method of presentation. A great deal of loss is bound to occur."[16] In addition, as stated above, the one basic element that determines whether or not verbalism is uneconomical is the extent of the commonness of the information, insight, and background of the conveyer and the conveyee. Hoban points out the importance of this apperceptive mass in these words: "No word of mouth or printed page can have meaning to an individual except as he has within his experience the necessary sense perceptions which will serve as a basis for interpreting it."[17] Imagine a teacher, for instance, verbally attempting to give her pupils an idea of an animal with which they are not familiar. She would have to describe its characteristics—shape, size, height, weight, covering, color, head, legs, fins, wings, tail, ears, teeth—and this description would have to be made on the basis of the characteristics of animals with which the pupils were familiar. Besides, they would have to understand the meaning of these various characteristics—legs, tail, teeth, color, and so on, before they would have any idea what she was talking about.

Very probably the reader of this book cannot define, describe, or illustrate these words: "quirister," "vadose," "xiphiplaster," and "nidget." His inability to understand them is based on his lack of previous experience with these symbols. Even if he has had some experience and as a result has some idea of nidget, for example, he might still be in the dark because of a lack of sufficient experience. His understanding of nidget as used in a sentence would depend on his comprehension of its various meanings—an idiot, a type of horse, hoe, a tool, or working with this tool (and each of these in turn would have to be understood)—and the context of the sentence. Says Dewey:

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[16] J. J. Weber, "Comparative Effectiveness of Some Visual Aids in Seventh Grade Instruction," p. 8, Educational Screen, Inc., Chicago, 1922.

[17] C. F. Hoban, Visual Education and the School Journey, *Pennsylvania Educational Monograph*, vol. 1, no. 6, p. 7, Department of Public Instruction, Harrisburg, Pa., 1927.

> Learning involves not only a knowledge of things but also the meaning of things. Mere symbolism learning is useless verbalism. The words of the textbook are not ideas until they have been transformed into concepts through real or vicarious experiences which are consequently of primary importance.

In "My Education Creed" Dewey stresses about this same idea in these words:

> The image is the greatest instrument of instruction. What the child gets out of any subject presented to him is simply the images which he himself forms with regard to it. If nine-tenths of the energy at present was spent in seeing to it that the child was forming proper images, the work of instruction would be infinitely facilitated.

The traditional methods of teaching are for the teacher to (1) "tell" the lesson and later test the pupils to see whether they "learned" it and (2) assign a lesson and then test by having the pupil recite it. The results of these two methods are what might be expected. In the first method it is easy for the teacher, who has probably taught the material many times and who knows it well, to assume that the pupils get it more easily and quickly than they actually do; and if a later test proves otherwise, she is quick to cry "unprepared pupils," "low I.Q.," "lack of industry," and other popular "justifications." Furthermore, in all such telling there is a great loss because of the necessity for frequent and uneconomical explainings and re-explainings.

Both these methods of teaching, but more particularly the second in which a pupil learns his lesson and gets ready for the recitation, are usually more or less delusory in another way. It is easy for the teacher naïvely to assume that because the pupil recites his lesson satisfactorily he thereby proves that he has mastered it—that it is meaningful to him. We all know very well that many a perfect recitation is made which means to the reciters nothing more than a mouthing of the symbols. Probably all of us while in school "passed," with the help of good memories and artificial repetitions, courses about which we then knew and now know no more than the proverbial rabbit. We gave the appearance of having learned although we had not. Like parrots, we learned and repeated only symbols. Verbalism, which, Dale says, is a "disease caught in school," may not only represent handicapped and uneconomical learning, but it may also be responsible for mislearning and even downright bluff.

In summary, verbalism is an important method of imparting information or conveying ideas; we could not live in a modern society without it. However, it may be either economical or uneconomical, depending largely on the experience and the apperceptive mass of the learner. In any case, it is an indirect method of instruction because it is symbolic only. In traditional teaching verbalism has been greatly overemphasized, often with very unsatisfactory, and sometimes with downright deleterious, results. But teaching without it would be impossible.

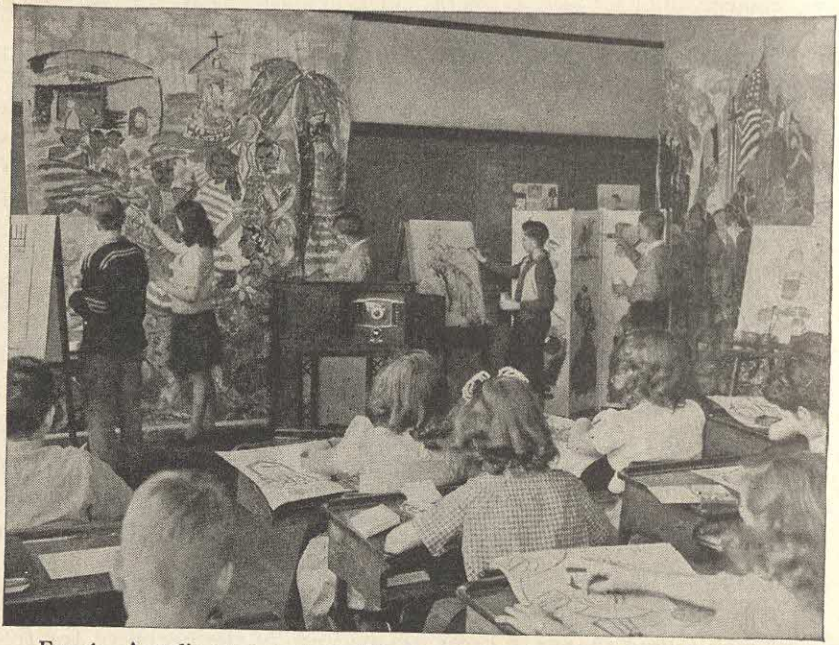

FIG. 4. A radio-art program utilization in the Ruggles School, Chicago.

Direct experience. Because the individual learns first through his sensory channels, such learning is usually the most natural and consequently the easiest. When the pupil sees, hears, touches, tastes, and smells, his experiences are direct, concrete, and more or less permanent. The difficulty a teacher would have in effectively describing a new animal to her pupils was pointed out in the previous section.

How much more easily and accurately could they learn to comprehend it by actually seeing it. And how much more readily and successfully could they comprehend the essential elements or characters of a geometrical figure, scenic beauty, a famous picture, and an industrial process by actually experiencing them. In such instances the impressions are firsthand, clear-cut, accurate, and usually meaningful rather than secondhand, vague, inaccurate, and meaningless, as they are likely to be in verbal descriptions. Fewer misunderstandings and misinterpretations will occur from firsthand experiencing.

Sensory experiences are not only essential to better understanding, but the extent and success of the pupil's future learning and mental activity also depend on them. Even in our conversation we continually use some form of visualizing. Our similes, "black as coal," "white as snow," "strong as a horse," "like a flash," help to clarify or emphasize the idea that we are attempting to convey by utilizing the previous experience of the listener. It is logical to assume that the greater the number and variety of these experiences, the better able the pupil will be to comprehend and interpret other new ideas as they are presented to him later. All this means that the school must furnish as many opportunities as possible for direct sensing in order to widen the pupil's environment. Some of the illustrative items, objects, and specimens can be brought into the classroom; others can be made available through school and community exhibits; and still others through trips to various local and distant points of interest. The possibilities for direct contact are not only numerous but also varied in any school and community.

Direct sensory experience with representations or reproductions. Usually firsthand experience is the most educative type of experience, but sometimes it is not, and often, too, it is neither desirable nor possible for the pupil to obtain it.

It is certainly not desirable for the pupil to obtain firsthand experience with disease, accidents, fire, and bad social and physical habits because such experience is too expensive. Yet it is desirable that he have a vicarious experience with them in order that he will be able to recognize their characteristics, operation or action, and effects. The wide use now made of photographs, drawings, diagrams, mannikins, and posters, as well, of course, as verbal textual material, in health and safety drives and campaigns helps to provide these vicarious experiences.

Secondly, firsthand experiences are not always possible. The average pupil cannot in person see the Egyptian pyramids, the Eskimos in their natural environment, marine life on the ocean floor, or a distant volcano, cave, building, castle, or battlefield. To have direct contacts with these and other inaccessible objects and phenomena would be too expensive in both time and money to arrange. In such instances, although experience with representations may not be so valuable as direct experience, it is helpful because it is based on more or less faithful reproductions of these items. Photographs, drawings, working models, and replicas may lack some of the impressiveness of the originals, but yet they serve adequately, and some of them, such as stereographs and sound films, are surprisingly effective. In addition, these reproductions are not only convenient to bring into the classroom but are relatively inexpensive.

In the third place, there are situations, objects, or types of phenomena where a reproduction is even better for instructional purposes than the original. The original may be (1) too complex, (2) too big, (3) too small, (4) too fast, (5) too slow, (6) too inaudible, or (7) too untimely to be successfully experienced firsthand. Illustrations of these, given in the order suggested above, will clarify this point and show how the appropriate representations can function.

A complicated machine in operation is no doubt intriguing because it is spectacular, but watching it may give the individual no idea whatever of how it works, of the unseen detailed parts, processes, and relationships. In such an instance a simplified or cutaway working model can be effectively used to explain the principles and operation of the real machine.

A group of buildings, a watershed, or a city may be too extensive or large for the pupil to see all its parts and relationships in their proper perspective. Here a replica, a relief map, or a diagram can be used successfully to present the original item.

Sketches, enlarged photographs, microphotographs, slides, and motion pictures can be used to show very small objects that cannot be seen satisfactorily and adequately by the unaided eye.

Phenomena that occur too fast for the eye to follow, such as the flight of a bullet, or the bending of the surface of water when a pebble is dropped into it, can be reproduced clearly by slow-motion photography. Conversely, phenomena that occur very slowly, such as the growth of a plant or its turning to the sun or the opening of a flower, can be speeded up by means of time-lapse photography.

Inaudible sounds can be picked up by the microphone and reproduced, and thus they can be heard. Another good illustration of a setting in which the reproduction may be better for instructional purposes than the original is music. Radio broadcasts are popular in school music programs, and undoubtedly they have stimulated beneficially the study of this subject. However, in teaching pupils to recognize and appreciate the various elements involved, listening to a locally played transcription of a number can be much more educative than listening to the number as it is originally played by the artist or music organization. The original rendition is given once. The transcript can be played many times; it can be played slowly or fast; and it can be stopped at any point for replaying or for discussion by the teacher and her group. In one playing the members of the group may listen to the selection as a whole; in another, they may listen for the theme; in another for the harmony; in another for the contributions of the various instruments; and in other playings they may note the accent, tempo, phrasing, and other elements that compose the number. The pupil could certainly never listen understandingly and successfully for all these items in the single first rendition. It is true that the reproduction may lack the attractiveness of the original, but it is just as true that the reproduction offers him far more music-learning opportunities than the single original rendition alone would provide.

Some phenomena, such as a snowstorm, eclipse, or growing crop are seasonal, and others, such as a flood or fire occur at irregular and unpredictable times. The possibilities of actual and timely pupil experience with both these types are remote. However, the pupil can *through pictorial representation* experience them at any time.

The relationship of verbal and audio-visual instruction. Although the point may be clear from the discussions of this and the previous chapter, it can profitably be emphasized that visual instruction is not something distinct from general instructional activity but rather an integral part of it. Visualizing cannot be separated from verbalizing. Showing an aid is not the same as using it. One could not merely show a picture, for example, of an unknown animal, allow the pupils to look at it, and then dismiss the group and assume that the pupils had learned all that they needed or wanted to know about it. The picture does not tell the whole story. Looking at it must be supplemented by talking about it. Such questions as, "Where does it live?" "What are its habits?" "What and how does it eat?" and "Is it harmful or beneficial?" will immediately arise and have to be answered by verbal discussion or still other illustrative material, which in turn will require some verbal clarification. As Merton points out, almost any picture contains elements–size, temperature, motion, distance, depth, color, odor, speed, weight, and so on–which are abstractions for the pupil. Even such aids as maps, charts, cartoons, and graphs are more or less abstract presentations. They require explanations.

In short, the relationships of verbalism and visualizing are reciprocal; each supplements and reinforces the other.[18] Experience in itself is not necessarily meaningful, but instruction helps to make it so; likewise, instruction in itself is not necessarily meaningful, but experience helps to make it so. Further, verbal instruction is not always uneconomical nor is audio-visual instruction always economical. Each has its own particular functions, and each may be, and undoubtedly is, often misused.

It is proper to emphasize again that verbalism is not always difficult, nor is visualization always easy. As was suggested above, a picture, graph, or map, or a phonograph or radio presentation may be abstract and, consequently, very difficult for the pupil to understand and appreciate. As a matter of fact, an audio or visual representation will always be an abstraction until the pupil has the necessary background of experience and understanding with which to interpret it. These devices are aids to learning; they are not mystical "instantaneous teachers." There is no magic in them.

STIMULATION

Psychology has pointed out the absurdity of the statement of the old man who when asked what he did all day, replied, "Well, sometimes I sits and thinks, and then sometimes I just sits." As a matter of fact, he never in his life "just sat" without some form of mental activity going on unless he was asleep, and even then his mind, or a section of it, might have been working a part of the time. During waking hours one's mind is always "on the go." The type or quality of its activity may range all the way from idle and scattered wanderings to the deepest of reflective concentration, but the mind is always busy. Naturally, the more control the individual has over it, and the more he can exclude extraneous reflections, organizing and focusing attention on the problem at hand, the more clearly he thinks.

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[18] How publishers are beginning to develop visual materials for use with their textbooks is described by officials of five of these companies in A Symposium: The Correlation of Films with Textbooks, *Educational Screen*, pp. 543–549, 564, December, 1947. See also p. 230.

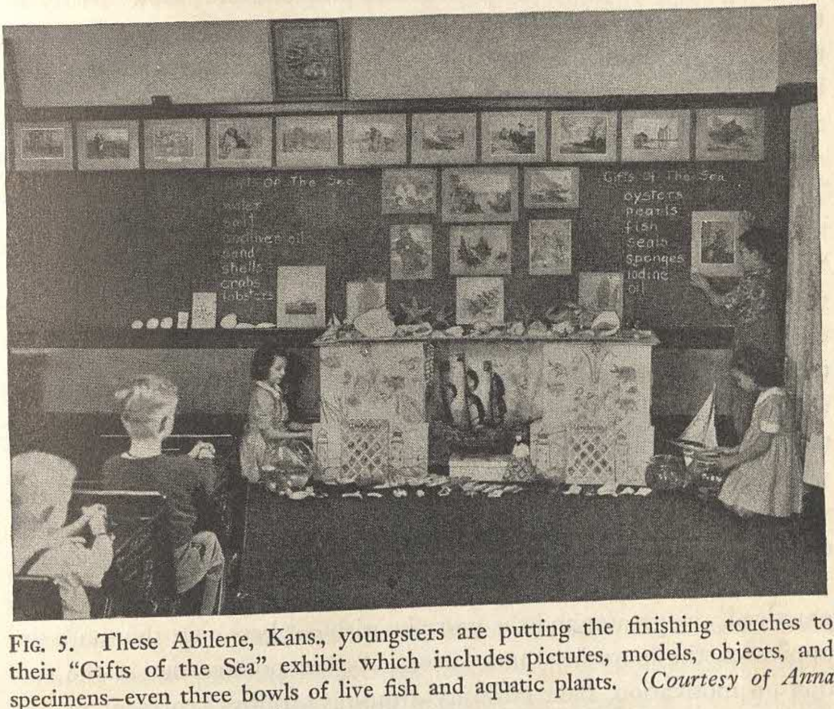

FIG. 5. These Abilene, Kans., youngsters are putting the finishing touches to their "Gifts of the Sea" exhibit which includes pictures, models, objects, and specimens—even three bowls of live fish and aquatic plants. (*Courtesy of Anna Davis and The Instructor.*)

What is true of the adult is also true of the child. His mind is always working even if not on the lesson before him but on one or a number of other things. Not yet under control, it is restless and incapable of prolonged focusing. In one way, at least, this may be a blessing in disguise. Mental restlessness probably guarantees a breadth of interest that would not be possible if the child could focus his attention unreservedly for a considerable length of time. The intelligent teacher knows these facts and not only provides for rest or "letdown" periods but also utilizes appropriate and varied devices to captivate the wandering mind.

One of the weaknesses of traditional schoolteaching is its failure to tie up more closely the various lessons, projects, and tasks. Many of them lack continuity. The pupil prepares and recites his lesson and then tends to dismiss it from his mind. The procedures of assigning lessons, testing (either in the recitation or in the formal examination), and giving a mark for the work encourages the further development of this attitude, often expressed by the statement, "I had that course." The implication is that the course was taken and passed and could therefore be forgotten. Credit for it had been deposited in the "bank." A good teacher attempts to stimulate the pupil to further mental activity about the elements and possibilities and uses of a particular lesson, but often this is difficult to do, especially with materials that are academic and relatively unrelated to the pupil's life. Even those that are closely, or should be closely, related frequently become merely formal academic stunts done to please the teacher, thereby winning "pay." They will be merely formal academic stunts if the appropriate personal applications are not made and if the essential curiosities are not aroused.

Curiosity is natural and therefore can be practiced. The more it is practiced, the greater and the more insatiable it becomes; the more the pupil sees, the more he wants to see. As was pointed out in the section on motivation, their curiosity-arousing qualities represent one of the advantages of visual aids. It is true also in verbal instruction that the more the pupil really "sees"—senses and understands—the more he wants to see, but the formal and handicapping procedures of this type of instruction often restrict and limit his seeing. A device or technique that does not arouse curiosity and subsequent intellectual or other activity can hardly be called educational. Even sensory experience, although basic, is but the starting point of learning; if further experience does not emerge naturally out of it, it represents largely a temporary diversion.

Audio-visual aids are effective in stimulating mental activity because, usually at least, they are interesting and relatively easy to master. In their use the pupil's natural curiosity is not stifled, as it is frequently in formal verbalized work. Instead, curiosity is encouraged; the wise teacher recognizes that this is one of the important objectives of the use of these devices. Hence, both the teacher and her pupil are likely to have quite different attitudes toward the same material when it is presented verbally than when it is presented in a more direct and concrete form. The average pupil hesitates to ask questions in the formal recitation for fear of showing his ignorance and thus losing the respect of his teacher and his fellows. In the more informal setting of visualized instruction he feels freer because this setting is more like an out-of-school situation in which his queries come easily and naturally. Because both the teacher's and the pupil's attitudes are favorable, it is easy to promote the further development of this questioning mind-set.

A well-capitalized sensory aid, then, not only satisfies a definite lack that the pupil feels, but at the same time it causes him to feel new lacks. Imagine the many questions—hows, whys, wheres, and whens—that arise in the pupils' minds while they are examining even the simplest object or specimen, a leaf, rock, cow's horn, piece of cloth, or bit of glass, and how, as a result, such an item becomes the stimulus for an astonishing array of possibilities for further sensing and learning. Out of the pupil's rather informal, easy, and interesting experience come not only new information but new questions, new problems, new implications, and new possibilities, each of which in turn leads to other new ones.[19] Its effect is really of the oft-quoted "activity leading to further activity" idea. Out of its use, then, grows additional cerebration—reflecting, associating, imagining, evaluating, and organizing.

The discerning teacher does not merely wait for this additional interest to appear. Instead she very definitely and deliberately works to ensure that it does come. For instance, the wise trip leader not only makes certain that the children intelligently and satisfactorily see what they came to see, but she also arranges the details of the trip in order to pass by other interesting objects, exhibits, offices, animals, processes, and so on, to arouse their interest in these and thus sow the seeds for additional trips. Even in showing a photograph, slide, motion picture, model, specimen, or other aid, the teacher can similarly prick the pupils' curiosity in order that they will want to see more, hear more, and learn more. In this procedure the children are led, not driven, and they will feel that they themselves have contributed. Such a feeling of participation adds to interest in the item or project.

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[19] One of the best illustrations of this that the author has ever seen grew out of a small smooth stone, which a high-school assembly speaker held up for observation. This stone, which came from the stomach of a prehistoric monster where it worked as a digestive assistant, was the starting point of a story that held the attention of more than one thousand students for nearly an hour.

A final point concerns permanency of learning. Probably all of us have heard teachers say (and no doubt most of us have said or felt like saying), "The pupils just don't seem to remember what they learned last term," "They should have been taught that in grade school," or "My work is handicapped because I have to go back and teach them what they were supposed to have learned before." The average pupil does forget a great deal (and who doesn't?), and most of such forgetting is educationally wasteful. Why does a pupil forget? Mostly for one or more of these reasons: because he did not (1) see clearly what he was supposed to learn; (2) experience vividness of learning impressions; (3) feel the importance of this material; (4) relate it to his other knowledge and experiences; and (5) learn to use and apply it.

Obviously, most of these reasons are deeply rooted in the bookish and formalized methods and materials of the traditional school, an educational setting in which the pupil receives nearly all of his learning through limited sensory experiences. Just as obviously, if the setting incorporates opportunities for learning through additional sensory channels, his retention of these experiences should be increased. A good audio-visual program provides these opportunities. Of course, it would be stupid to assume that under more favorable learning conditions the pupil would remember all that he learned. We are not even intimating that. In fact, if the sage who said, "One of the tests of a good and useful mind is to be found in what it forgets," is right, the pupil should forget some things. What we are saying is that multisensory experience should increase permanency of learning. There is ample proof that it does.

To review, a most important advantage of this type of learning is that it is motivated largely intrinsically; the pupil is not stimulated by fear of punishment or desire for reward, but rather he is interested in exactly the same way in which an adult would be interested in some new concrete object or process, that is, naturally. He has little other thought than to satisfy his curiosity—to understand the thing. Once he comprehends it, he has the thrill that comes with mastery. This thrill helps to motivate further experience and incite additional attempts at mastery. Audio-visual aids, wisely used, stimulate purposeful and vitalized self-activity, and this is much more profitable and permanent than a more or less passive, and often bored, listening.

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3

PRINCIPLES UNDERLYING THE SUCCESSFUL USE OF AUDIO-VISUAL AIDS

It is self-evident that teaching devices or materials of any kind can be no better than the use to which they are put. And this holds for audio-visual aids—they may be potent in instruction or they may be time killers, depending on how they are utilized. Proper capitalization of any device, process, or opportunity depends upon the extent to which such utilization follows the lines of previous successful experience with it. The greater this experience is, the more clear cut and definite are these principles.

Some types of audio-visual aid, such as the motion picture and the radio, are new, and the vigorous movement to capitalize sensory aids for instructional purposes is of recent origin. Thus we have had relatively little experience with these aids and, consequently, do not have a large and substantial foundation on which appropriate principles of utilization can be based. However, we have had some experience, and on the basis of this, together with pertinent reasoning, we can arrive at what, at the present time at least, appear to be logical principles. It is quite possible that in time some of these may be eliminated, some changed, and even new ones added. The principles set forth and briefly discussed in this chapter appear to have sufficient justification for their inclusion. Perhaps some of them may appear to be trite, but they are included in order to give emphasis, show relationships, and complete the picture.[1]

Intelligent and cooperative faculty support should be developed. It is discouraging to note that in many schools apparently the first step taken in the development of a program of audio-visual instruction—often because of the influence of some salesman, an address, a summer-session course, or a desire "to keep up with the Joneses" in another school or system—is to purchase a motion-picture machine, a slide projector, a radio, or some other device or material. When this is unpacked and displayed, the first question asked is a pitiable, "Now what do we do?" or "How shall we use it?" Neither educative nor administrative competence is represented in this deplorable situation.

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[1] A more detailed discussion of a number of these topics will be found in Chap. 19.

The first step in the introduction and development of a program of audio-visual instruction is the education of the teachers in order that they will become intelligent and cooperative supporters of it; without this support the program will most certainly fail, and such failure will handicap it for years. Here again, because this educational emphasis is relatively new in most schools, not all teachers and administrators need be expected to be enthusiastic about, or competent in, it. Few of them have had appropriate training; some are apathetic, skeptical, or fearful; and some recognize the possibilities but are inexperienced. A very few may be both enthusiastic and competent. Although faculty support will probably never be either complete or completely intelligent, it must be substantial. A serious, sensible, and unhurried campaign of education will help to develop this support and thus provide a favorable setting for the program. Several months, or even an entire year, may be required before the faculty is sufficiently prepared for the initiation of a program. But this period of preparation will represent a good investment of time and effort.

Such an education of the teachers may be promoted by a number of devices, such as (1) reviews of the literature on the subject; (2) general faculty discussions; (3) reports of practices in other schools; (4) talks by competent teachers and experts; (5) extension courses; (6) visits to other schools; and (7) demonstrations of equipment and materials. A committee, composed of those teachers who, on the basis of interest, training, and experience, are most competent, can be used to good advantage in the promotion of this necessary faculty support.

Sometimes it is suggested that a good plan for initiatory consideration is for one or more of the teachers, who are enthusiastic about the possibilities of the audio-visual aid program, to develop it for their classes. This introductory use might prove its value and thus interest other teachers in its possibilities for their own work. However, because equipment and materials are numerous in possibilities and expensive in money, the average school administrator will hesitate to purchase very much for the use of only one or two teachers. Consequently, perhaps a better plan is to attempt to interest the entire faculty in it. If this is accomplished, special attention to the audio-visual program becomes a definite part of school policy as a whole, and the money for materials and equipment will be more easily available.

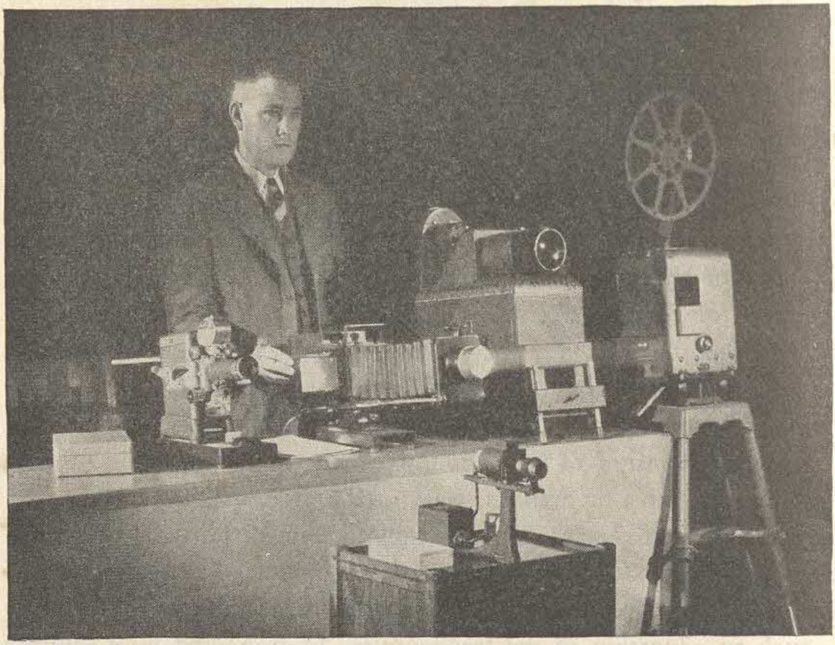

FIG. 1. A student experimenting with different types of projection equipment in the audio-visual teaching laboratory at Iowa State University.

Sensory aids should be carefully selected. Because a great deal of audio-visual aid material is now being produced, choices will have to be made. There is as much logic in using care in the selection of these aids as there is in the selection of textbooks, seats and desks, typewriters, fuel, and other material and equipment. Perhaps even more so, especially in the case of the expensive items, because some members of the community are certain to wail about these purchases of "fads and frills"; and if poor purchases can be pointed to, these wails will carry that much more weight. Poorly selected aids will bring unfavorable criticism from everyone concerned—teachers, pupils, and taxpayers and in this way handicap the program severely.

It should be axiomatic to state that only the very best of opinion should be considered in this selective process. In some schools there are teachers, supervisors, directors, department heads, and administrators who, on the basis of their training and experience, are more or less competent to give counsel. Expert opinion may also come from teachers of sensory-aid courses, experienced individuals in other schools, and from reports of investigational studies, experiments, and researches. In some instances it may be both possible and desirable for those interested to test out or try out the item being considered. In any case, the selection should be neither hastily nor arbitrarily made.

It should usually be feasible for these aids to be selected by the teachers who will use them the most. The busy principal or superintendent is, generally speaking, no more competent to select them unaided than he is to select the textbooks and other materials and equipment that the teachers need. Probably he should be a member of the selecting committee, provided his personality and position are not allowed to become too dominant. As implied above, a committee composed of those teachers most competent to choose these aids should be officially charged with this responsibility. Naturally, its opinion should be respected.

Detailed information concerning the various items may come from a variety of sources, such as catalogues, announcements, advertisements, exhibits, samples, reviews, magazine articles, books, reports from other users, and salesmen. Salesmen are an excellent source, provided several of them are interviewed or allowed to demonstrate. Each is interested in selling his own product, but each is undoubtedly familiar with the products of other companies, and, therefore, if it is suggested that the committee is considering these other products also, he may point out weaknesses or disadvantages of them which the group should know about. It is true, of course, that the salesman may overemphasize or inaccurately represent the product of the other company. However, the more accurate information the committee is able to obtain, the more intelligently it should be able to select products. Incidentally, it must be kept in mind that the selection of a particular device by some other group or school does not necessarily prove the value of this device. Probably all schools have made poor buys.

Blind buying is always hazardous; the committee should establish and follow the policy of seeing before purchasing. It is well to remember that new models, equipment, and materials are often advertised before they are ready for distribution. No matter how attractive they may appear on paper or in the salesman's talk, they should not be bought. Every new product has "bugs"—faults, flaws, errors, or weaknesses—which only actual use will locate. An intelligent consumer allows someone else to find these "bugs." Competitive demonstrations or tryouts under identical conditions represent an excellent method of obtaining comparative data. A wise salesman will welcome such an opportunity. If he does not, he evidences a lack of confidence in his product and should be avoided.

The suitability or value of a particular article should be judged on the basis of such questions as the following, not all of which are, of course, equally applicable to all types of aid.

1. Specifically, for what educational purposes is it designed?
2. To what extent will it probably accomplish these purposes?
3. Is it interesting? Comprehensible? Concrete? Clear? Concise? Natural?
4. Does it suggest new questions, problems, material, implications, applications?
5. Is the material that it presents accurate and authentic?
6. Is the educational element overshadowed by the dramatic or the spectacular?
7. Can it be used effectively by, or for, the pupils for whom it is designed?
8. Are teaching guides and suggestions included with it?
9. Is it free from undesirable advertising or propaganda?
10. Is it easily and conveniently operated, manipulated, handled, or used?
11. Is the price reasonable? How does it compare with the price of other similar products?
12. Is it well made mechanically? Durable?
13. To what extent is it guaranteed, if this is essential?
14. Can repairs and replacements be obtained easily?
15. Is there any possibility of danger when it is being used?
16. Will it represent an attractive and respected piece of equipment?
17. Does the company that produces it have a good reputation?

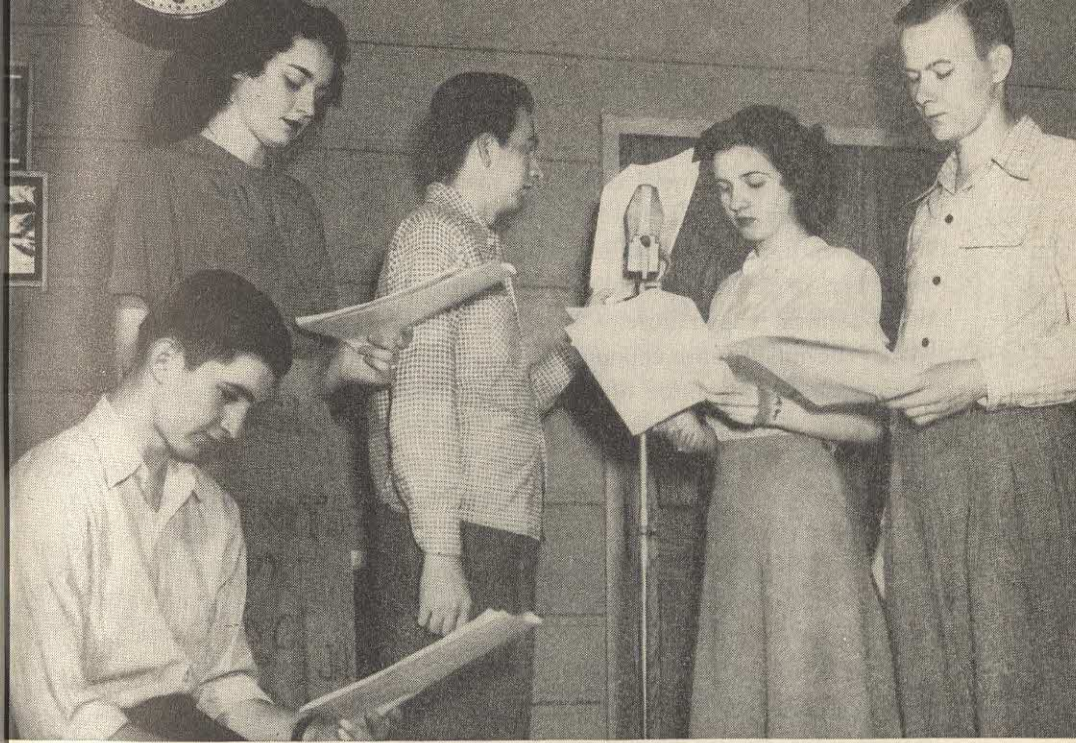

FIG. 2. These members of the radio class at Bloomington, Ind., High School are presenting a simulated broadcast. (*Courtesy of Glenn Van Horn.*)

Sensory aids should be economical financially. It is a well-known fact that some audio-visual enthusiasts have splurged, which, according to Webster, means they made an "ostentatious demonstration," in the purchase of equipment and materials. Perhaps in some cases this splurge was made honestly with a sincere desire to improve instruction, and perhaps in other instances it was made dishonestly with the main emphasis upon proving educational progressiveness or modernness. Undoubtedly, in many schools there are expensive but little used projectors, models, radios, rooms, and other equipment and materials that represent a poor educational and financial investment. It should be prosaic to state that the measure of value of an audio-visual program is not to be found in the amount of money invested in it but to the extent that the objects of the investments are intelligently used. And also, that purchasing equipment and materials and then attempting to locate settings in which they may be used is no more logical than buying a bedroom suite without considering where and to what use it shall be put. Local needs and uses determine the wisdom of audio-visual purchases.

In another way the money invested does not necessarily represent a good index of financial economy. One projector might appear to be a good buy because it is relatively inexpensive. However, because of limited uses, quality of engineering or materials, unreliability of producer, or difficulty of obtaining repairs, it might represent a very uneconomical expenditure. A higher priced projector might ultimately be much more economical.

Here again, the price of an aid does not inevitably represent its true value. Manufacturers of many kinds of products often market two (or more) models or types, which are practically the same except for minor but easily seen differences, pricing one considerably higher than the other. They recognize that very, very frequently the consumer will buy one model because he naturally assumes that it is better because it is more expensive—a conclusion that does not necessarily follow.

In still another way, financial economy is concerned. The use of damaged aids, scratched records, cracked slides, smudged pictures, marred films, broken projectors, or unworkable models are educationally uneconomical because they distract attention and reduce respect; their effectiveness is handicapped. Because they are educationally uneconomical, they are also financially uneconomical.

The teacher must know the specific function of the various aids. As was pointed out in the previous chapter and as will be explained and illustrated more in detail later in connection with the discussions of the various types of aid, each device has its own particular function; it can be used more advantageously in some settings than in others. For some types of material the motion picture can be used with maximum effect, and for others it would represent an absurd impossibility. Similarly, the photograph, slide, specimen, map, or transcription represents a better presentational device in some educational settings than it does in others. Further, an aid must be used at the proper place in a lesson—at the beginning, in the middle, at the end, or elsewhere, depending on its function. The use of one aid when some other would be more profitable or the use of an appropriate aid at an improper time is uneconomical. Obviously, a knowledge of the particular uses of each aid is essential to the most intelligent capitalization of it.

The teacher must know how to use the various aids effectively. Knowing the functions of the various aids and wisely selecting them for particular purposes and settings do not represent the whole story; the teacher must be able to use them intelligently. There are certain more or less established techniques in the use of instructional aids just the same as there are in making assignments, asking questions, giving examinations, and promoting discussion, and the teacher must not only be familiar with these but also have some skill in using them properly and at the right time. Naturally, this means additional education and training. Because these methods vary with the type of device, they will not be discussed here but later in connection with the presentations of the various aids.

The aid used should be appropriate to the age, intelligence, and experience of the pupils. An aid is an aid only if and when it really aids. It will never aid maximally unless it is suitable to the backgrounds, abilities, interests, and needs of the pupils. As someone has pointed out, it must be suited to the physical, psychological, intellectual, and social development of the group with which it is used. If it is too difficult, it will handicap ready learning; if it is too simple, it will create undesirable pupil attitudes. It is entirely possible, with even the same group of pupils, for an aid to be suitable in one type of learning setting and unsuitable in another. Here again, experimentation or evaluated use by the teacher will help to determine which aids fit particular groups or educational levels, and also which phases or elements of these aids are appropriate for the various types of educational setting.

The teacher must make sure the pupils obtain actual firsthand experience with the aids. Because of her previous training and experience it is easy for the teacher to continue to be the talker, actor, doer, handler, and user when she teaches with instructional aids, and when she does, she makes certain that at least a part of the pupils' experience is secondhand. In some instances and with some types of material this procedure may be proper, but in others it is wholly improper. Generally speaking, an aid in the hands of the teacher is not so valuable as an aid in the hands of the pupil.

In the second place, the teacher or official often overfeels his responsibility for protecting the materials and equipment of the school. Many a school librarian guards her books with such a jealous care that she gives the impression of being more interested in having them in their proper places on the shelves than in the hands of the pupils. Similarly, in many schools visual aids are little more than locked-up and somewhat inaccessible exhibits. If the teacher or her pupils face discouraging formalities or difficulties in getting the aids, their attitudes certainly will not be conducive to easy learning. Naturally, the aids should be protected, especially the high-priced and complicated machines and devices, but at the same time those which can be safely and effectively used by the individual pupils should be kept easily available.

An aid should be actually taught, not merely displayed.[2] Merely looking at a photograph, diagram, or motion picture, or listening to a transcription or a radio broadcast does not necessarily mean that the pupil gets the full meaning from it. Sensory aids are not mystical or magical devices through which the pupil becomes instantly and completely educated. At best they are still only *aids* to instruction; they are not substitutive but supplementary; they do not represent complete educational settings in themselves. It follows, therefore, that the teacher should have very definite purposes in using an aid and that she lead the pupils to understand and appreciate the reasons why it is being used.

All aids are more or less abstract, and some of them are considerably so. Hence they need clarification either through other aids and verbal discussion or through verbal discussion alone. Some items in them will have to be pointed out, explained, or emphasized. Always, or nearly always, in the use of these aids there is a danger that the pupil may be attracted by the unusual features and if these do not represent the main theme, thus miss the point of the lesson. It is very easy, often, for "the side show to eat up the main tent." The teacher is the individual who can prevent this. She can do it only if she actually leads the pupils, as she does in any other instructional setting, to recognize and understand essentials. One of the conclusions of the study by the Research Division of the National Education Association was, "The superior effectiveness of the teacher as contrasted with any material device was indicated repeatedly in this investigation."[3]

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[2] Of course, the aid itself is not taught, only the material it represents. The use of the word "taught" is for purposes of contrast.

[3] "Thirteenth Yearbook," p. 453, Department of Elementary School Principals, 1934.

As a matter of fact, the general principles underlying the teaching of a good lesson involving the use of aids are probably not much different from those underlying the teaching of formal textual materials. A definite assignment that causes the pupils to feel an important lack and develops an anticipation of having this need satisfied, appropriate preparation by both teacher and pupils, an interesting, economical, pertinent, and applied presentation, ample opportunity for pupil participation, a good summary, and a fair test are as important in audio-visual instruction as they are in any other type of teaching procedure. And it cannot be overemphasized that pupil participation is a fundamental of a successful lesson.

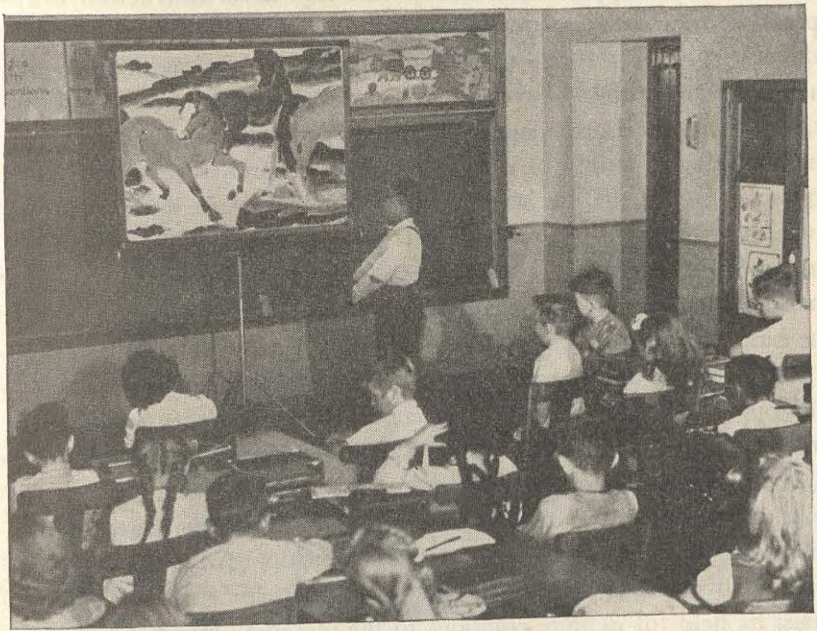

FIG. 3. The Cleveland Schools FM Station WBOE and Division of Visual Education cooperate in bringing sixth-grade pupils a series of art appreciation programs. In each classroom slides in color are synchronized with the comments of a broadcaster from the Cleveland Museum of Art.

Pupil participation is basic to successful learning. Even though there is such a thing as group teaching, there is no such thing as group learning. All learning is an individual affair. What a person does and how he reacts—not what his teachers and classmates do and how they react—determine what he learns. He may learn from these other individuals, but his learning is strictly within his own self. This is another way of saying that they may do the teaching, but he himself must do the learning.

The basic law of learning is that we learn by doing. Hence the pupil must learn by direct participation. Too often this is interpreted to mean physical participation, and in audio-visual instruction it appears to mean to many teachers that the pupil himself should handle the objects, look through the stereoscope, operate the working model, act in the play, or help with the demonstration. Undoubtedly in certain settings these are educationally very desirable and profitable, but participation certainly also includes mental sharing because after all the main end of the use of audio-visual aids is to assist in the development of mental images and concepts. The pupil who reacts mentally, who weighs, solves, evaluates, questions, applies, and so on, is really participating in the solution of the problems at hand, at least as far as he himself is concerned—and this must be his main interest.

By their very nature, sensory aids are interesting and appealing to the pupils, but herein lies a real danger—that of a confusion of mere interestingness with educativeness. This is especially possible with aids that closely resemble commercialized entertainment, such as the motion picture; the movie attitude or "Hollywood heritage" of passive receptivity must not be allowed to develop. An aid is not a device of diversion and must not be allowed to become one. The pupil must be held for definite reactions to the material presented, irrespective of the methods by which it is presented. This may be accomplished through discussions, questions, formal and informal examinations, sketching, drawing, reporting, evaluating, and so on—all of which represent reactions, participation, and self-activity. The more the pupil is stimulated, the more he participates and the more his learning is facilitated.

Teacher preparation is absolutely necessary. Any successful teacher recognizes that a good lesson depends upon plans carefully worked out in advance. Probably in no type of teaching activity is previous preparation more important than in sensory instruction because of the danger of an interested but undiscriminating experience with the device and the possibilities of its use. The teacher must know which elements of it are important and which are unimportant; specifically, just how the aid may contribute to an understanding of the lesson being taught, as well as to related past and future lessons, and how it can be most economically and advantageously utilized. For example, a teacher who has not previewed a film cannot successfully, that is, to best advantage, show that film to her class. Teachers' manuals and guides are now supplied with some types of aid, and the teacher may either follow these or adapt them to suit her own particular group and purposes. If no such helps are available, the teacher can develop her own, evaluating and improving them with each using. Several publishers have developed and made available motion pictures, filmstrips, and other aids for use with their textbooks. Undoubtedly, within the next few years there will be a great development in this field of assisting the teacher to use the aids.

Adequate pupil preparation is also necessary. As has been suggested several times previously, the pupil must be led to feel a need or lack that the aid can assist very materially in satisfying. This felt need and the anticipation of having it satisfied make for a favorable attitude or mind-set. To illustrate: the pupils may prepare for a trip by listening to the announcement, "Tomorrow we are going to the zoo," and having their coats and hats on at the proper time; or they may prepare by considering routes, time, expense, the animals to be seen, the particular characteristics, size, habits, food, and so on, of these animals and how this information fits into the lesson being studied. In the first illustration the pupils would merely look. In the second they would look for something—for answers to an array of very definite and pertinent questions—whats, hows, wheres, whens, and whys. Since their attention would be directed to the major elements in the lesson, they would have in mind very specific things for which to watch. Too, they would know why they were looking for these things. It is easy to see which trip would be the more profitable.

Utilizing sensory aids should represent an economical use of the time of both the teacher and her pupils. A very commonly raised objection to audio-visual aids was expressed by one teacher in these words, "I spend so much time running around getting ready and in cleaning up afterwards." It is quite possible that although an aid may be used economically as far as immediate educational results are concerned, it may represent an uneconomical use when the whole procedure of utilizing it is considered. An inordinate amount of time and effort may be expended in getting the aid ready for use, preparing the group for its use, using it, and finally caring for it and putting it away. On more than one occasion the writer has seen a group of nervously fidgeting pupils waiting for the teacher to run around and get the aids, prepare them for use, adjust and repair machines, and do other work that, except in emergencies, was unjustifiable because it wasted the time of the pupils. Efficient planning and executing by the administrative force of the school as well as by the teachers will prevent wastes.[4] On the other hand, rushing through a film or demonstration might save time but be uneconomical educationally. Very often repeating the film or demonstration, or parts of it, although it requires additional time, might represent a very economical utilization.

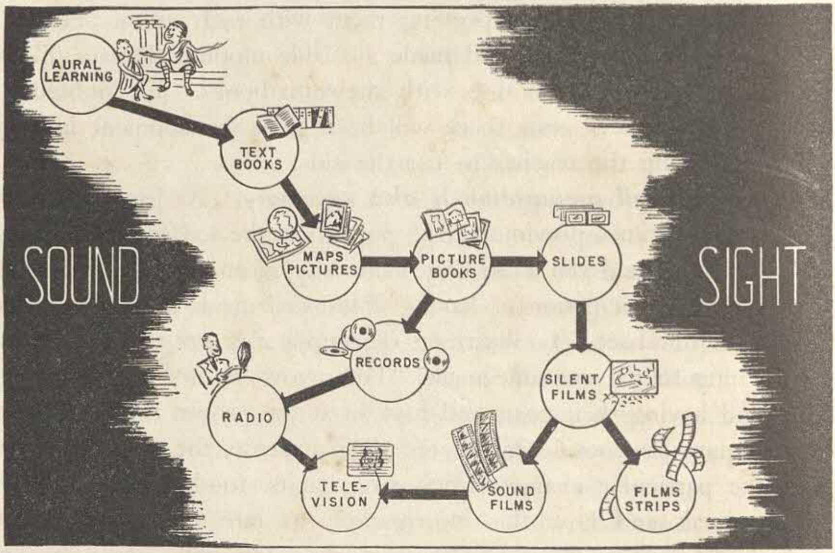

FIG. 4. Modern science has opened new avenues of learning. Each addition to the original teaching tool—the spoken word—has made education more interesting and efficient. (*Educational Screen.*)

Not too many aids should be used. In the past too few aids were used in classroom teaching. However, now there is a possibility that too many may be used, especially by those teachers who are enthusiasts. This possibility is due to several causes; among them are (1) the present great interest in this field and the consequent danger of teachers considering aids as sure panaceas for all instructional ills; (2) "quack interest"—the desire of some teachers and administrators to prove their progressiveness by a very liberal (but usually unenlightened) utilization of new devices, especially the more spectacular ones that receive ready publicity; and (3) the ease with which these aids are now obtained.

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[4] A very spicy story of "a glorious phantasy of errors"—a demonstration of the use of homemade lantern slides and the making of photographic slides, written by Anonymous under the title Confessions of a Visual Enthusiast will be found in *Educational Screen*, vol. 13, pp. 38–39, 52–54, February, 1934.

An adequate and varied supply of these aids is essential, but an indiscriminate and too free use of them, especially by those teachers who have not learned how to handle them successfully, can easily cause confusion instead of clarification. The utilization of an indiscriminate multiplicity of illustrations soon robs them of their value. Certainly not everything that can be illustrated needs to be illustrated. One very pointed and pertinent illustration is worth a dozen scattered and unrelated ones, even though they are interesting. Here again, owing to our immaturity in this field, we do not know just how many aids can be used satisfactorily, either in an entire schedule or in an individual lesson. This information will come with further experience and research. However, it is well to stress the point that a multiplicity of devices, or even the using of them, does not necessarily represent a well-balanced program.

Sensory aids should be continuously evaluated by those who use them. If audio-visual aids and the techniques of using them are to be refined and improved they must be evaluated. Although the average teacher is not in a position to do much controlled experimenting or scientific measuring, still she and her pupils are in a position to make subjective estimates of value. These evaluations are beneficial because they have some basis in fact.[5]

The teacher can evaluate on the basis of (1) the pupils' ability to use the aids effectively; (2) pupil interest and attitudes; (3) records of participation; (4) general class atmosphere; (5) reactions of the slower pupils; (6) formal and informal tests and examinations, and (7) the general scholastic record of the group. In some settings she may even be able to carry on simple experiments. True, some of these estimates may not have the support of columns of impressive-looking statistics, still they do have a basis which causes the teacher to make them. Hence they are valuable.

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[5] See also the discussion and footnotes, p. 224.

The teacher should, of course, also carefully evaluate her own techniques in the handling of these aids in order to distinguish between credit or discredit that should go to herself and credit or discredit that should go to the devices or to the administrative handling of them. The supervisor or director of audio-visual aids, department heads, and even the administrative officers of the school also are often in a position to help with this evaluation.

The pupils, too, can estimate the effects of this instruction. In fact, they should be led to feel that they have an individual responsibility in evaluating it. If the aids are designed to assist the pupils in their work, they should be the first to note their helpful effects. They are at least as close to their own needs and satisfactions as is the teacher and are probably quite as competent to judge results. These evaluations may be both written and oral. Some pupils would rather make them orally in a general discussion, and others would do a better job if they were allowed to write their reactions.[6]

Should the older pupils also evaluate the teacher's techniques and methods? Teachers differ quite markedly on this question. Many teachers have found pupil criticism to be an excellent device for improving their work. Others shy at it, usually holding that (1) pupils are not competent to judge a teacher's work; (2) such estimates are valueless because the pupils are biased by their emotional attitude toward the teacher; and (3) such familiarity on the part of the pupils lowers their respect for the teacher.

Are these reasons or objections sound? In general, the authors believe not, although in some instances there may be a bit of justification for each of them. Suppose we examine them. (1) The first objection is baseless, as many a teacher who has used this device can testify. The pupils are far better judges of the teacher's ability than we usually give them credit for being.[7] Why shouldn't they be?

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[6] Some manuals that accompany films and filmstrips not only outline the procedures for utilizing–preparation, presentation, application, and examination–but also include criticism, a teacher-pupil evaluation of the aids and techniques used with them.

[7] The report of the investigation of the opinions of 10,000 high-school students and 19,000 elementary-school pupils on the qualifications of the "teachers most helpful" will be enlightening to any individual who disagrees with the above statement. This report will be found in Chap. X of the "Tenth Yearbook" of the Department of Superintendence of the National Education Association, 1932. Similar studies of such evaluations frequently appear in our professional literature.

They have had several teachers and thus have a basis for comparison. They also know when they get their work and when they do not; and they know their own difficulties and the extent to which the teacher helps them over the rough places. (2) It is true that an emotional bias toward the teacher may mean favorable or unfavorable (and often useless) comments, but even these attitudes themselves are frequently good indices of the teacher's success. Too, a favorable criticism may give the teacher support, and an unfavorable comment really be well deserved. (3) The teacher who believes that "familiarity breeds contempt" is thinking more of her position than she is of her success in filling it. If she appreciated the fact that pupil recognition of her teaching ability would bring her more pupil respect than authority or anything else, she would not raise this objection.

In short, the authors contend that obtaining and studying pupil reactions toward the teacher's technique of using audio-visual aids is just as logical as obtaining and studying pupil reactions to these devices themselves. Of course, anonymously written comments are preferable to signed statements or oral discussion because the pupils will feel freer to make them and hence their reactions will tend to be more honest and sincere.

Further, because the great present emphasis on sensory aids is of comparatively recent origin and many of these aids are new, the conditions are most conducive to a free give-and-take between the teacher and the pupils. She is probably somewhat inexperienced in the handling, and the pupils in the using, of these aids, and, therefore, a close cooperation should contribute to better practice for both. The seriously conscientious teacher welcomes any and all criticisms, favorable or unfavorable, because she really wants to improve her teaching; and if she and her pupils understand each other on this point, her work and their work will be benefited because of this mutual understanding, feeling of responsibility, and cooperation.

A balanced program of audio-visual instruction should be developed. At the present time it is doubtful whether any one of us can accurately describe a balanced program of aids, but at least we all can be certain that it is one in which there are adequate variety and proper emphasis. Variety in types of aid is necessary first because of the individual differences of the pupils; a particular aid will not be uniformly effective with all of them. A photograph may appeal greatly to one pupil and considerably less to another; one pupil may become enthusiastic over a working model and remain relatively passive while watching a projection of pictures. Even though a new aid might be very attractive, a continued and uninterrupted use of it would certainly become monotonous.

Because an aid is more helpful in certain types of situation than in others, in the interest of covering all of these possibilities, a variety of types is absolutely necessary. Occasionally we hear some enthusiast show his ignorance by stating that such-and-so is the "very best audio-visual aid there is." There is no single *best* audio-visual aid. Each aid has its own particularized value and uses. For instance, Dent has pointed out that the stereograph is valuable in individual study; the glass slide or filmstrip in the socialized recitation; the motion picture in summarizings; and the chart and diagram in presenting abstractions and assisting analysis.[8] Another of the conclusions of the Research Division of the National Education Association will illustrate this point:

> The usefulness of motion pictures would be enhanced if they were so organized as to confine themselves to their own peculiar provinces. Their province seems to be the exhibition of moving objects and particularly to facilitate the analysis of motion. They are outside their province when they show still objects or when they enter the field of abstract verbal discussion.[9]

The fact that there remains much to be done in determining scientifically and satisfactorily the fields of greatest usefulness of each aid means that the use of a wide variety of aids and a continuous evaluation of them under all sorts of settings are imperative. Out of this experience and study will come the standards by which a program can be judged as being balanced or unbalanced. The individual teacher and her pupils can contribute by making serious attempts to evaluate their own experiences.

The above discussion concerns balance in types and number of aids. In addition, there must be balance as it relates to subject fields or departments. Usually a board of education votes a certain flat sum for the purchase of equipment and materials and leaves the allocation of this money to the principal, committee, or director of audio-visual instruction. This is a logical procedure, but its effectiveness obviously depends upon the sagacity of those authorized to distribute these funds. If some department, because of its progressiveness, aggressiveness, professional friendships, political contacts, or other reason, receives a too generous allotment, proper resentment will come from those departments whose needs are slighted. Here again, only wise and careful administration will guarantee equitable distribution and departmental balance.

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[8] E. C. Dent, "The Audio-visual Handbook" (rev. ed.), p. 25, Society for Visual Education, Inc., Chicago, 1946.

[9] "Thirteenth Yearbook," p. 453, Department of Elementary School Principals, 1934.

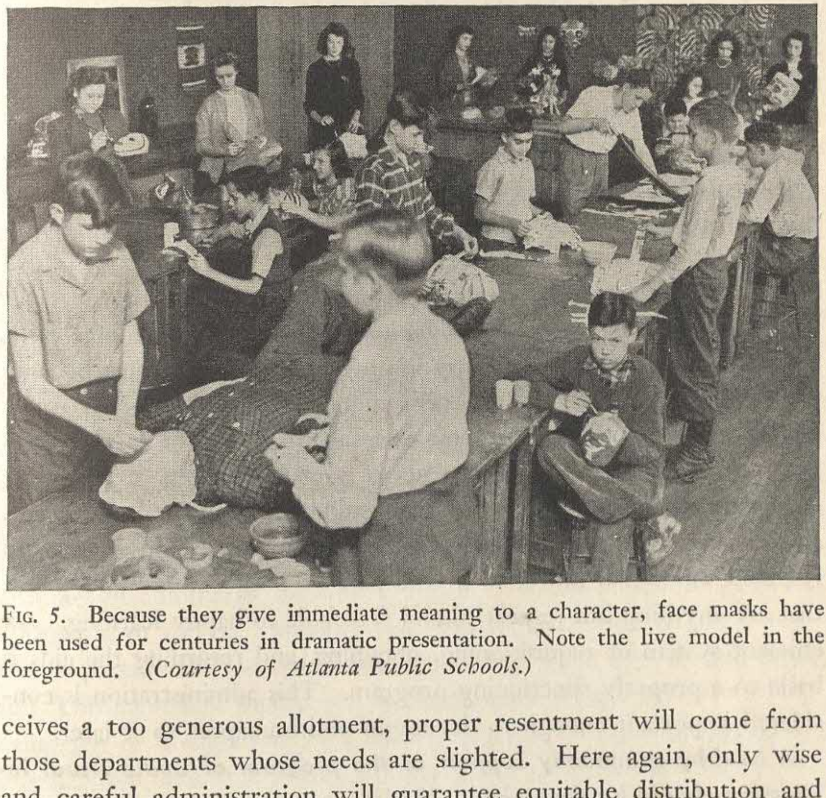

FIG. 5. Because they give immediate meaning to a character, face masks have been used for centuries in dramatic presentation. Note the live model in the foreground. (*Courtesy of Atlanta Public Schools.*)

The aids should be properly protected and preserved. Nearly all sensory aids will be used many times, and it is only reasonable that they should not only be used carefully but also be protected between usings. A smudged picture, broken model, torn map, or cracked slide will discourage initial interest and decrease respect. Where the aids are used by the individual pupils, suitable previous instruction in their use will help to ensure that they are carefully handled.

Pictures, clippings, maps, charts, posters, and similar materials may be mounted on cardboard, beaverboard, or railroad board, shellacked or lacquered, covered with isinglass or cellophane, edged with partout tape, and filed in folders or cabinet space. The larger materials can be glued to cloth, stretched tight, dried under pressure, rolled around dowels or sticks, and filed away in a receptacle or hung up on a rack. Certain types of specimens can be mounted on heavy cardboard or framed and covered with glass. Models and machines can be cleaned and placed in appropriate spaces in cases, drawers, or on tables. Phonograph records should be returned to their jackets before being filed. Suitable filing cabinets, cases, drawers, stands, rollers, and holders are, of course, necessary. An appropriate cataloguing or indexing system, such as the Dewey decimal system, will help to make the aids easily available.[10] If the pupils themselves are allowed to participate in this work of preparing, caring for, and filing, they will take a greater interest in properly maintaining the collection.

Aids should be located conveniently and circulated efficiently. "The organization and administration of visual materials must be such that they are available at the precise moment when the teacher wants them," says Dent.[11] This is most certainly true. If the teacher does not have the aid just when she needs it or if she gets it when she does not need it, she will have to make adjustments in her lesson plans, and last minute alterations always represent confusion and waste with resultant emotional attitudes on the part of both teacher and pupils that are anything but respectful and favorable to happy learning. An efficient system of requisitioning, obtaining, and returning the aids is basic to a properly functioning program. This administration is considered important enough to devote an entire chapter to it later.

A healthy community support of the program of audio-visual instruction should be developed. Healthy community support is essential to the proper development and functioning of an efficient school system because this system concerns the community's buildings and equipment, expenditures, employees, and children; it represents the community's biggest and most important business. This support will never come unless intelligent steps are taken to foster and promote it. This is one very important phase of educational responsibility that many school administrators neglect, often to their own ultimate sorrow and to their schools' detriment. Because of the rapidity with which educational conceptions, materials, equipment, procedures, and emphases are changing, it is absolutely necessary that the community be continually enlightened if the school is to become modern and be kept that way.

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[10] Pertinent and practical ideas on indexing and filing will be found in "American Library Economy Series," published by The H. W. Wilson Company, New York, 1927.

[11] Dent, *op. cit.*, p. 24.

Audio-visual instruction as a definite part of educational policy is new in most schools; hence it must be developed and presented to the community in such a way that it will merit and win wholesome support. It must really be "sold" to the community. Such support is especially needed in this program (1) because of the financial investment in it and (2) because of the possibility that the community will consider parts of it, such as motion pictures and radio, to be merely forms of commercialized entertainment instead of seriously planned education. The cry of "fads and frills" must be and can be silenced by an appropriate program of school-patron education.

Such a program of community enlightenment can be promoted by letters, bulletins, and reports sent to the parents and patrons; explanations, discussions, demonstrations, and dramatizations on graduation, promotion, Parent-Teachers Association, and similar public programs; newspaper publicity; school night; and school, store-window, and chamber-of-commerce exhibits of equipment, materials, and results. Although, of course, exhibits of equipment and materials are educative to parents and patrons, demonstrations of their uses are still more so. This campaign should not be in any sense a high-pressure selling campaign or bludgeoning but rather a dignified and serious program of education on a high plane. Certainly, not the least important phase of it is that represented by the stories that the pupils carry home. Consequently, a smooth-working and efficient program that the pupils can easily recognize and appreciate is basic to a successful promotion of community support.

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4

OBJECTS, SPECIMENS, AND MODELS

Man's early learning was about things, and it came from contact with these things. True, he may not have understood all about them (nor does he today), but at least the sensory impressions themselves were natural, clear, and realistic. Now, centuries and centuries later, in his formalized educational institution man shows his appreciation of the value of these direct experiences and arranges systematically for his children to have them. He realizes that even the slow-learning child can see some meaning in a concrete thing—object, specimen, or model. Further, he knows that it is natural and therefore pleasurable for the child to play with things—see, hear, feel, touch, handle, and manipulate—and he therefore capitalizes for educational purposes on this innate characteristic or trait.

Environment and education. Because an individual must live in close contact with the elements of his environment, acquainting the child with this environment and leading him to understand and appreciate its many elements and their interrelationships always has been, and always will be, a most important aim of any basic education. Formerly this environment was somewhat limited, and its elements and relationships were easily and quickly mastered.

But times have changed. Owing largely to the development of modern methods of communication and transportation, the individual's environment has increased greatly in extent. In fact, it includes almost the entire world. It has been stated that no place on the globe is more than sixty hours from any other place. The individual wears clothes, rides in vehicles, eats foods, lives in houses, and uses devices that come, in part or in whole, directly or indirectly, from every section of the globe. Furthermore, he reads, hears, and talks about these more or less distant but nevertheless real elements—people, activities, places, events, processes, products, traditions, and customs—many of which very vitally affect him. Because this environment is large and complex, its details cannot be mastered so easily and quickly as was possible when it was small and compact.

Information about his environment may come from indirect sources—books, pictures, talks, and so on—and from direct sources—firsthand contacts with it. Our interest here is in these firsthand contacts. In order to make these contacts the pupil must either go to his environment or have his environment brought to him. Both of these procedures are important and both are, in many instances, easily possible. The first of these procedures will be discussed in detail in Chaps. 11, 12.

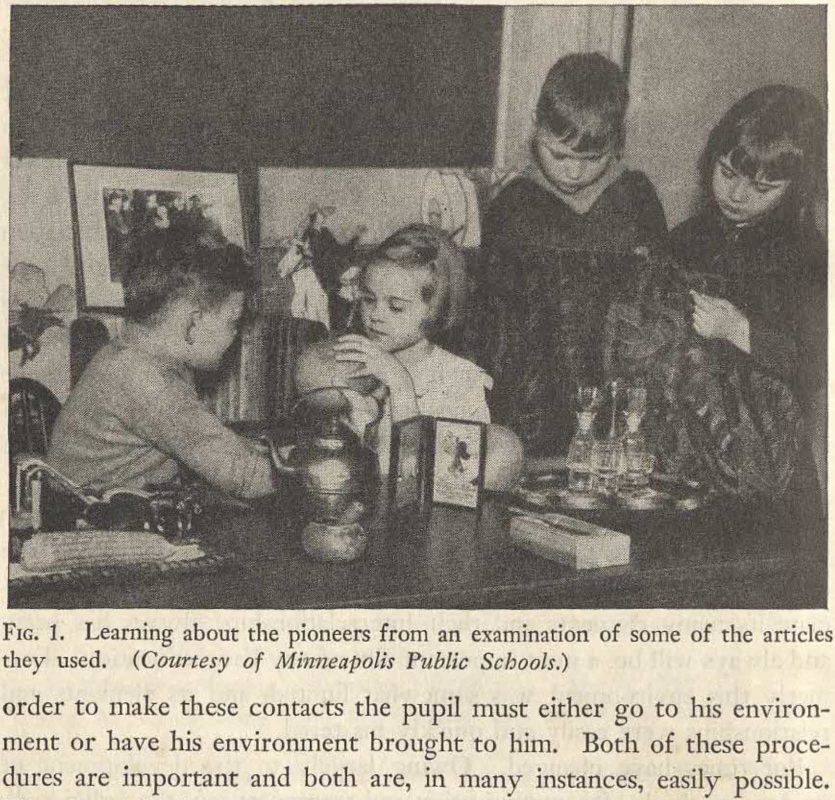

FIG. 1. Learning about the pioneers from an examination of some of the articles they used. (*Courtesy of Minneapolis Public Schools.*)

Naturally, only certain parts of the pupil's environment can be brought to him in the classroom. A rock or piece of lava or leaf from a mountain can be brought in, but not the mountain itself. A locomotive or an automobile is too large to be brought in, and besides, its operating mechanism is too complicated or concealed for the pupil to be able to understand it firsthand easily; therefore, a working model, cutaway model, or mock-up, or all three are used. As the large animals of prehistoric times are no longer available, scaled-down models are used to represent them. Microscopic phenomena are reproduced by scaled-up models. The life cycle of an insect cannot be observed in its entirety nor the detailed processes of the manufacture of some product be followed through; hence, for these follow-through processes representations become necessary. Of course, some of these items may be represented by photographs and drawings, and probably should be, as well as by objects, specimens, and models. The point being made is that objects, specimens, and models, properly selected or designed and presented, can be very useful in helping the pupil to understand and appreciate the elements of his environment and the relationships of these elements.[1]

Phases of this environment are reflected in every subject and in every activity of the school, and, consequently, in every subject and in every activity there are opportunities for the functional utilization of appropriate concrete objects and processes or representations of these. To some teachers and administrators the expression "objects, specimens, and models" would immediately limit the discussion largely to science, art, and the social studies. Such a restricted view only evidences a lack of recognition and appreciation of the possibilities. A moment's consideration of the suggested list of items (pages 82–83) will indicate some of these possibilities in literature, composition, foreign language, mathematics, agriculture, home economics, music, and other subjects. These items are also used in the so-called "extracurricular" activities—in dramatics, in school clubs, in home-room and assembly programs, in thrift activities, in school publications, in parades, store-window displays, and other advertising of drives and campaigns, and in hobby and summer-activity exhibits and fairs. The possibilities of the utilization of objects, specimens, and models are as wide and varied as the entire program of the school.

Definitions of object, specimen, and model. Although defining the types of sensory-aid devices is less important than indicating how they may be used, for clarity's sake a classification or distinction should be made. The definitions suggested by Cline M. Koon of the U.S. Office of Education appear to be justifiable:[2] objects are "the things themselves"—insects, fruit, vegetables, thermometers, tools, weapons, fire extinguishers, leaves, animals; specimens are "parts of objects"—pieces of glass, wood, leather, paper, crystals, asbestos, or porcelain; and models are "replicas of objects"—house, engine, boat, airplane, bridge, steam shovel, or coal mine. These models may be operating—a drawbridge, pump, solar system, or water wheel—or nonoperating—a simple weapon, animal, tool, or table.

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[1] Note that nearly all of the toys of small children—dolls, dollhouses and furniture, trains, ships, airplanes, wagons, automobiles, weapons, animals, and so on, are models.

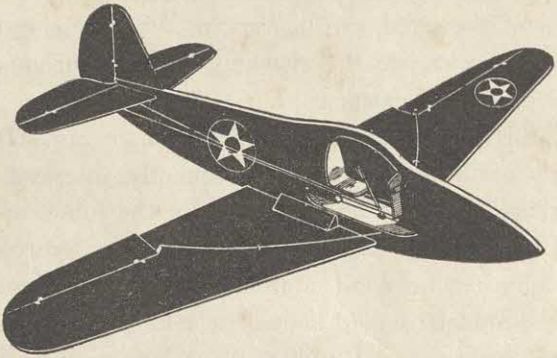

FIG. 2. Working models show very clearly the construction and operation of mechanical devices. In the above model the stick and pedals operate the control surfaces just as in a real airplane. (*Central Scientific Company.*)

The sand table. The mention of this device usually brings to mind a number of kindergarten or first-grade children playing in the sand. There is no question but that the sand table or sand pile is the most popular of all the playthings of the small child. The idea that it is only a plaything is entirely erroneous.

The sand table can be one of the most valuable of all teaching aids. Certainly, as Dent points out, it is the most adaptable. It can be used and is being used not only in all grades of the school in a great variety of ways and in practically all subjects, but also in colleges, universities, military and naval services, landscaping, horticulture, real estate selling, engineering, and other types of situation and occupation.

The sand table is inexpensive if bought, or it can be easily made and equipped. A simple box, 1 by 4 by 8 ft., mounted on short (length depends on age of users) sturdy legs, half-filled with sand, and equipped with a trowel or garden tool and whisk broom, is basically all that is needed. Representations of trees, buildings, bridges, rocks, animals, human beings, fences, and so on, are easily made. If desired, appropriate backgrounds may be made from cardboard, light wood, or fabric materials, suitably painted. Labeling is done with stick signs.

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[2] C. M. Koon, "School Use of Visual Aids," Bulletin 4, p. 12, U.S. Office of Education, Washington, D.C., 1938.

One of the main advantages of the sand table is that it can be used time and again; it can be readily rearranged in all sorts of ways. This, too, is probably its main disadvantage—the representations may be easily disarranged or destroyed through careless use. They are not permanent. Another important advantage is that the picture can be clearly seen from several different angles by all those around it.

TEACHING WITH OBJECTS, SPECIMENS, AND MODELS

The general principles underlying the use of audio-visual aids have already been suggested, but it is appropriate here to emphasize three of the most important and to illustrate these with uses of objects, specimens, and models.

The pupil must participate directly. An object, specimen, or model is used in order to give the pupil actual firsthand experience, and of necessity, this means direct personal contact with the object. Usually, though not always, the more direct this experience is, the more educative it is. This direct experience can be direct only if and when the pupil himself sees, feels, handles, operates, and in other ways actually works with the item. Sometimes, especially in the case of a limited number of items, teacher, and even pupil, demonstration and experimentation may be satisfactory and profitable; but generally speaking, the individual members of the class should have ample opportunity for personal experience in examining leaves, hefting metals, tasting seasonings, unraveling threads, operating models, and similar activities. In such instances experiencing is personal, hence, vital.

Frequently, especially in the case of a limited number of objects or the necessity for a very close supervision by the teacher, this personal experience means that the group will have to be smaller than the usual sized class. Charles R. Toothaker, Curator of the Philadelphia Commercial Museum, and long an able leader in school-museum cooperation, states:

While a great deal can be said for the visits of classes to museums and the systematic help on the part of the museum in the actual classwork, whether in the classroom or in the museum itself, there are many who believe that individual work with children, not in large groups but singly or with two or three children together, is possibly more important than the handling of any age in large numbers.[3]

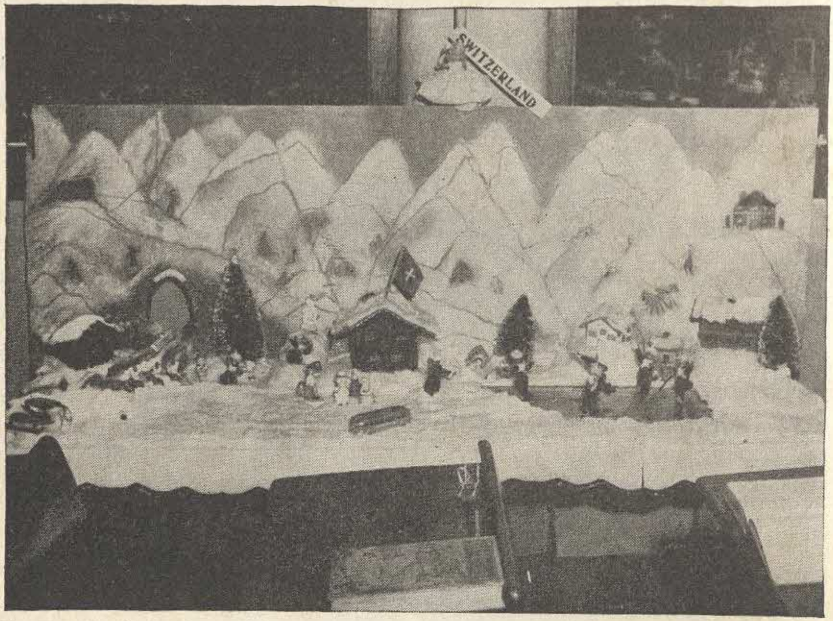

FIG. 3. Pupil-made models are educationally valuable to those who make and those who view them. (*Courtesy of Lucille Costello, Glen Oak School, Peoria, Ill.*)

Pupil participation may be of various types, such as reading additional material; demonstrating, experimenting, and investigating; designing, executing (or collecting), arranging, and displaying similar, imitative, or supplementary objects, specimens, or models; sketching, drawing, painting, or photographing; keeping diaries or records; writing stories, descriptions, poems, and jingles; and discussing or debating before his own or other groups. Here again, individual interests, capacities, and abilities should be recognized, respected, and capitalized.

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[3] C. R. Toothaker, *Proceedings of the National Education Association*, vol. 68, p. 925, Washington, D.C., 1930.

Observation and use must be educative. It has been pointed out previously that in the utilization of any aid the teacher must have a definite purpose in mind and must also guarantee that the pupils themselves recognize it and appreciate its place and importance. In looking at an item, say a model of an automobile, pupils may see it from different angles: one may be interested largely because it is novel; another may be thrilled by its aesthetic appeal–its proportions, lines, and color combinations; another may be equally stimulated by its mechanical parts and their operation; another may be impressed by its economic implications; and another may see only its provisions for safety. It is quite possible that none of these "seeings" may represent the teacher's main purpose in showing the model. It is proper for the pupils to be given an opportunity to have some undirected first experience in the aspects that appeal to them, but after this the teacher must center their attention on the phase that represents the purpose of the lesson or unit of instruction. The pupils must be led to look definitely for something, not merely be allowed to look. The item under observation is not merely "stuff"; it is "stuff" with a purpose.

In the second place, the pupil's attention must be directed in such a way that he sees the object or specimen in relation to its proper surroundings; he must see a leaf as an essential element of a tree and the tree as an essential element of man's environment.[4] It is sometimes rather difficult for the pupils to understand and appreciate a model because (1) it is out of its functional relationships, hence it is only partly real; (2) it is larger or smaller than the original; and (3) it is oversimplified. The gap between the representation and reality may be wide and confusing. The teacher must help the pupil to bridge the gap between the model and the original. Henry Johnson pertinently says:

> But its (exhibition method) value as a means of recalling reality is easily overestimated. What is the nature of the imagery? . . . Models and pictures are not entirely concrete exhibits. They are representations and not reproductions. . . . Models and pictures must, therefore, be consciously

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[4] This is a true story. Recently a Chicago schoolteacher showed a stalk of wheat to 206 seventh- and eighth-grade pupils and asked them what it was. Fifty-four of the pupils named it correctly; 109 did not have the least idea what it was; 27 said it was oats; 8, rye; 5, barley; 1, corn; 1, bearded wheat; and 1 boy thought it was a corncob. Of course, it is quite as probable that the exhibition of some object peculiar to city life would be as unidentifiable to a group of rural children.

treated as aids to visualization and not as subjects to be themselves visualized. They are materials to be developed. The direct appeal to the eye is in most cases only a beginning.[5]

In a great many instances the use of additional aids, pictures, films, slides, filmstrips, and so on, in connection with the object being studied will give additional meaning to it because these will help to show it (1) in its functional relationships, (2) in its proper size, and (3) in its natural form, not oversimplified. Then it ceases to be a representation; it becomes a reality.

In teaching with objects and specimens there is often a very real danger that the pupil may be overwhelmed with too many items and too much detail. For example, in examining a case of butterflies or a collection of minerals the pupil may not concentrate properly; his attention may jump aimlessly from one specimen to another. Because his attention is pointless, he may see all of the specimens and still know little more than he did before he looked at them.

After emphasizing that a demonstration is a dramatic performance in which the teacher is the star of the show and the pupils are the audience, Dale suggests the following principles for improving demonstrations.[6]

1. Plan every step carefully in advance.
2. Rehearse your demonstration with a "guinea pig" if possible.
3. Outline the required steps on the blackboard.
4. Keep your demonstration simple.
5. Do not digress from the main ideas.
6. Check all along to make sure that your demonstration is being understood.
7. Be sure that every member of the class sees the demonstration.
8. Do not hurry your demonstration.
9. Do not drag out the demonstration.
10. Keep summarizing as you go along.
11. Pass out written materials.
12. Repeat the demonstration, if advisable.
13. Evaluate the demonstration.

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[5] H. Johnson, "Teaching of History in Elementary and Secondary Schools," pp. 227–228, The Macmillan Company, New York, 1922.

[6] Edgar Dale, "Audio-Visual Methods in Teaching," pp. 125–130, The Dryden Press, Inc., New York, 1946. The principles only are indicated here. Dr. Dale's excellent discussion should be read in its entirety.

Further interest, application, and activity must emerge. Although the study of an object, specimen, or model should satisfy the immediate needs or lacks felt by the pupils, it should also stimulate further inquiry and activity. In the example suggested above, merely seeing or even operating the model is not nearly so important as recognizing

FIG. 4. A specimen which the student himself can handle, dissect, and sketch is certain to be intriguing. (*Chicago Apparatus Company.*)

how the automobile has very vitally affected, either directly or indirectly, nearly all of man's activity—economic, political, commercial, social, and educational. The inferences, implications, and applications involved should lead to an appreciation of broader relationships and more generalized and more abstract experience, laws, and principles.

Of course, it is entirely possible that time and efforts spent on these concrete objects and processes may be uneconomically used. If the pupils in their seeing, handling, and generalizing receive only experience, or false or artificial experience, their time and efforts are, relatively speaking, wasted. Doubtless many really interesting projects in designing and constructing models have represented a poor investment, educationally.

It should be needless to state that all such experience should be definitely and directly correlated and integrated with the important past, present, and future considerations of the material represented by this particular topic or lesson.

THE SCHOOL MUSEUM

Not only should every school have a museum, but every school can have a museum. In this country are to be found school museums which vary in size all the way from the limited exhibits of the one-room rural school to the magnificent collections of Cleveland, Buffalo, St. Louis, and other large city systems.[7] It is well known that children like to collect and that many of them have collections of their own. If it is appropriately suggested to them, they will doubtless react most favorably toward the idea of a school museum and cooperate most enthusiastically in developing it. Such a project is intriguing and it is educative. It requires no extrinsic motivation. Planning, accepting, and discharging individual responsibility, doing the necessary research in obtaining, understanding, classifying, mounting, and labeling exhibits, evaluating their own and their neighbor's efforts, and working together for the common good certainly mean educational benefits for all pupils concerned.

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[7] The Children's Museum, Boston, is described by B. Elliott in This Museum Belongs to the Children, *Nation's Schools*, vol. 30, pp. 20–22, December, 1942. A visit to this museum is described in J. R. Farbes, The Children's Museum, *Journal of the National Education Association*, vol. 31, pp. 46–47, February, 1942. G. F. Ramsey's Children See and Do in This Museum-School (*Nation's Schools*, vol. 31, p. 46, January, 1943) outlines a full day program of the American Museum of Natural History. "The Child Explores His World" is a three-reel (with manual) silent film that pictures the work of the Brooklyn children's museum. It may be obtained from the Harmon Foundation, Inc., 140 Nassau St., New York.

Further, such a project is not particularly difficult. It can capitalize on almost any kind of collecting interest, thus guaranteeing variety in the final exhibits. It is also readily possible because objects, specimens, and models are easy to obtain and inexpensive to mount and display. Fannie W. Dunn says: "No environment is so poor as to afford no materials of value, and none so rich as to require no supplementation." [8]

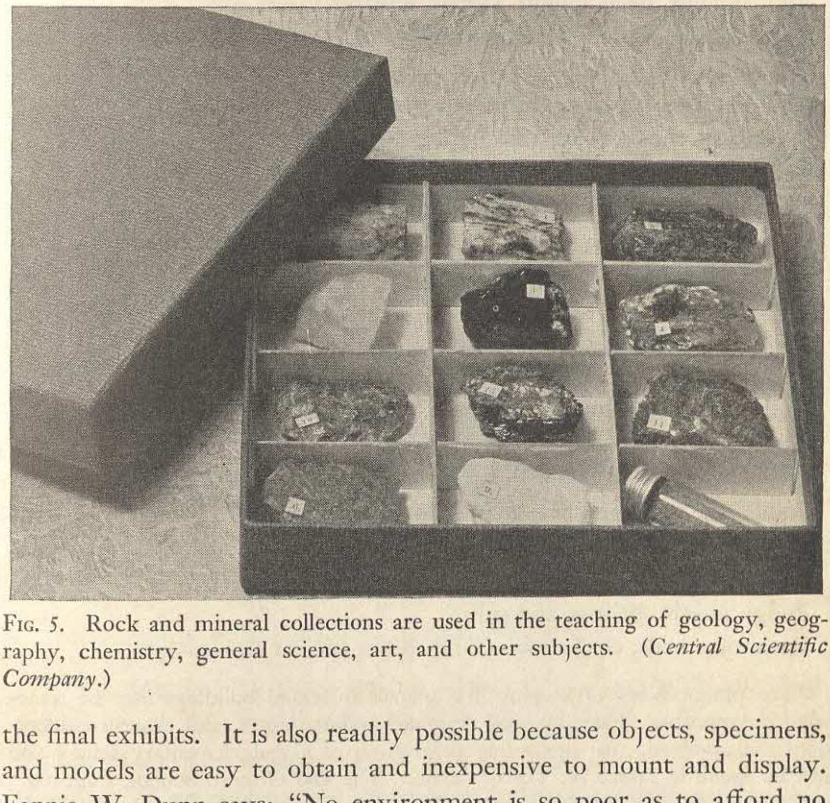

FIG. 5. Rock and mineral collections are used in the teaching of geology, geography, chemistry, general science, art, and other subjects. (*Central Scientific Company.*)

Preferably, a great proportion of this work should be immediately functional, that is, directly related to regular classroom (or extracurricular) activities rather than an end in itself. Making a relief map, a natural habitat, or a picture scrapbook, or collecting minerals, leaves, or nests will bring a natural approach to the subject under consideration, motivate the necessary research, and when completed, will represent a neatly tied-up summary of the unit.

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[8] Materials of Instruction, "Eighth Yearbook," p. 42, Department of Supervisors and Directors of Instruction, 1935.

Material for the school museum. The following list will suggest a few of the items, objects, specimens, and models that can be included in the school museum:

Anatomical: skulls, bones, claws, organs, feathers, teeth, skins.
Animals: rats, mice, rabbits, kittens, squirrels.[9]
Apiary: bees—drones, workers, and queens; honey, comb honey, beeswax.
Aquarium: fish, tadpoles, frogs, turtles, snails, water plants.
Art: pictures, paintings, sculptures, posters, advertising illustrations.
Beverages: cocoa, coffee, tea, soft drinks.
Building material: brick, tile, wood, metal, paint, nails, asbestos, hardware.
Clothing: period and costume; hats, shoes, dresses, coats, gloves.
Coins, money, and stamps: [10] domestic and foreign; ancient and modern.
Communication: ancient methods and materials; telephone, telegraph, radio.
Cooking and serving equipment: dishes, utensils, devices.
Curios and souvenirs.
Dolls: ancient and modern; domestic and foreign; clothing, equipment.
Fabrics: ancient and modern; domestic and foreign.
Flowers: local and national; wild and domesticated; fresh and pressed.
Foods and food products: domestic and foreign.
Foreign articles: money, foods, clothing, stamps, posters, pictures, games.
Fuels: wood, coal—anthracite and bituminous, oil.
Fungi, mosses, lichens, and galls.
Furniture: beds, chairs, tables, and so on; ancient and modern.

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[9] The practicability of keeping live animals in school buildings may be somewhat questionable. Care, humane treatment, odors, health, and other considerations are involved. An interesting description of a real elementary school zoo will be found in Frank W. Trevor's article, The Zoo Goes to School, *Education*, vol. 61, pp. 369–371, February, 1941. The boys with the help of a parent in the building trade built a special building, 20 by 36 ft., and later a greenhouse, on a nearby pond and stream. The exhibits included live birds, animals, fish, plants, small invertebrates, and so on, as well as collections of specimens and photographs. The zoo and greenhouse are maintained by shifts of pupils. Outside activities include bird banding, photographic field trips, and so on.

[10] See Wilber Emmert, Postage Stamps and School Work, *Educational Screen*, vol. 16, pp. 196–199, June, 1937. This excellent article also includes a good bibliography. Postage Stamps as Visual Aid Material in the Teaching of Geography, by J. K. Anthony, *Journal of Geography*, vol. 47, pp. 325–328, November, 1948, is also pertinent.

Grass and grass seeds.
Indian relics: arrowheads, flints, celts, hatchets, fishhooks, harpoons, pottery.
Insects: bugs, moths, butterflies, grasshoppers, flies, larvae, eggs.
Jewelry: ancient and modern.
Leaves,[11] twigs, nuts, seeds, galls.
Metals: pure and alloy.
Nests: bird, rabbit, wasp, mud-dauber.
Pictures: paintings, drawings, sketches, daguerreotypes, photographs, reproductions.
Plants: flowers, ferns, grains, cacti, vegetables, bulbs.
Post cards and illustrated travel folders.
Pottery: vases, bowls, birdbaths, water bottles, ash trays, pitchers.
Publications: books, bulletins, magazines, newspapers.
Radio equipment and materials.
Raw materials: cotton, flax, silk, latex, foodstuffs.
Reptiles: snakes, lizards, salamanders.
Rocks, stones, minerals, ores, fossils, petrified wood.
Seasoning: salt, sugar, pepper, nutmeg, cinnamon, vinegar, sage, cloves.
Seeds and grains.
Shells: conch, scallop, oyster, clam, sea horse, crab, coral.
Timepieces: devices, watches, clocks—ancient and modern.
Tools and implements: ancient and modern.
Toys and playthings: domestic and foreign; ancient and modern.
Weeds and weed seeds.
Wood: various kinds, cut to show grain; knots, bark, unusual growths, burls, cones, nuts, buds, pulp, sawdust, diseases.

These articles may come from a variety of sources such as (1) the pupils' homes; (2) the community; (3) local and distant industrial and commercial establishments; (4) fairs and exhibitions; (5) city and state chambers of commerce; (6) exchanges with other pupils and schools; and (7) public and private museums.[12] Some of these items may be obtained for permanent exhibition and use, and some of them may be borrowed for temporary use. Many of the models may be made by the pupils themselves. Discrimination should be used in order that only really educative material be collected or made. A good school museum is not merely a collection of items but a usable collection of useful items.

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[11] See R. B. Power, Leaf Prints and Pupil Interest, *See & Hear*, vol. 2, pp. 28–29, April, 1947.

[12] See also the list of sources, pp. 580–584.

If the museum is considered a more or less fixed part of the school, an accurate record of each exhibit—names of teacher and pupils responsible, date, purpose, utilization, expense, and any other pertinent information about it should be made and kept in a record book or in some other permanent form. If the list of exhibits is very extensive, an appropriate catalogue should be mimeographed or printed and made available to all teachers.

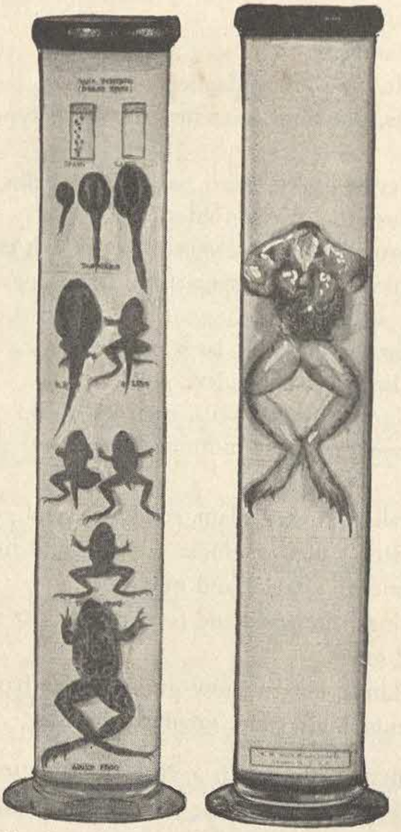

FIG. 6. By means of this eleven-stage series the student can follow the life history of the frog. Then he can turn the jar around and see a dissection of an injected adult specimen. (*W. M. Welch Manufacturing Company.*)

Preparing objects, specimens, and models. The pupils should not attempt to rival museum experts in the preparation, mounting, and display of articles, but they should attempt to imitate the recognized and accepted procedures of these professionals. It is really surprising what can be done by the teacher and her pupils with such simple articles and materials as the following, all of which can be collected: jars, bottles, cans, wooden boxes, pasteboard boxes, cigar boxes, window glass, shades and rollers; paints, nails, glue, wire, cotton, old picture frames, thread, string, pins, thumbtacks, blotting paper, Beaverboard, Celotex, tape, cement, magnifying glasses, brushes, and simple tools. Even though this is not the proper place for a description of the detailed processes of making exhibits, a few suggestions will indicate some of the simpler possibilities.[13]

Mounting and constructing exhibits. Metals, ores, leaves, shells, woods, and similar objects and specimens can be wired, nailed, glued, or screwed onto mounting boards (either made or purchased) of wood, plywood, Beaverboard, or Celotex, or onto the bottom of shallow boxes or drawers.[14] Butterflies and moths may be placed on cotton in shallow glass-covered boxes or frames. Seeds and grains may be placed in jars or bottles; live insects, in moist earth and twig-supplied glass jars with perforated lids; toads, snakes, and lizards, in screened boxes supplied with rocks, earth, and moss; nests, on enclosed shelves; and fish, tadpoles, and water plants, in a bowl or aquarium. Working models should be mounted on a wooden or metal base.

Evolutionary exhibits can be easily and effectively planned and executed. Typical ones are the life cycle of a butterfly, moth, dragonfly, or Japanese beetle; the reduction of ores; the fabrication of alloys; the growth of plants and flowers; the manufacture of soap; the preparation of sugar; the development of artificial lighting or of water, land, or air transportation, showing the process from the raw material or the beginning through the stages of growth or manufacture to the final product.

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[13] Very practical detailed suggestions on preparing material for exhibition may be obtained from Grace F. Ramsey's 25-page booklet, "Project Making in Elementary Science," published by the American Museum of Natural History, New York, 1934. Planning and arranging exhibits of rocks and minerals are described in F. B. Loomis, "Book of Common Rocks and Minerals," G. P. Putnam's Sons, New York, 1923.

[14] Suitable supplies may be purchased from the Denoyer-Geppert Company. (See Chap. 21 for complete addresses of all sources of visual aids given in footnotes.)

In addition, the pupils may design and execute more complicated exhibits such as a habitat or similar natural group. A very brief description of how the elements of such an exhibit are made may be suggestive. A habitat composed of earth, water, shrubs, trees, grass, and insects may be constructed on a suitable board base. The water is represented by a piece of window glass painted on the underside.

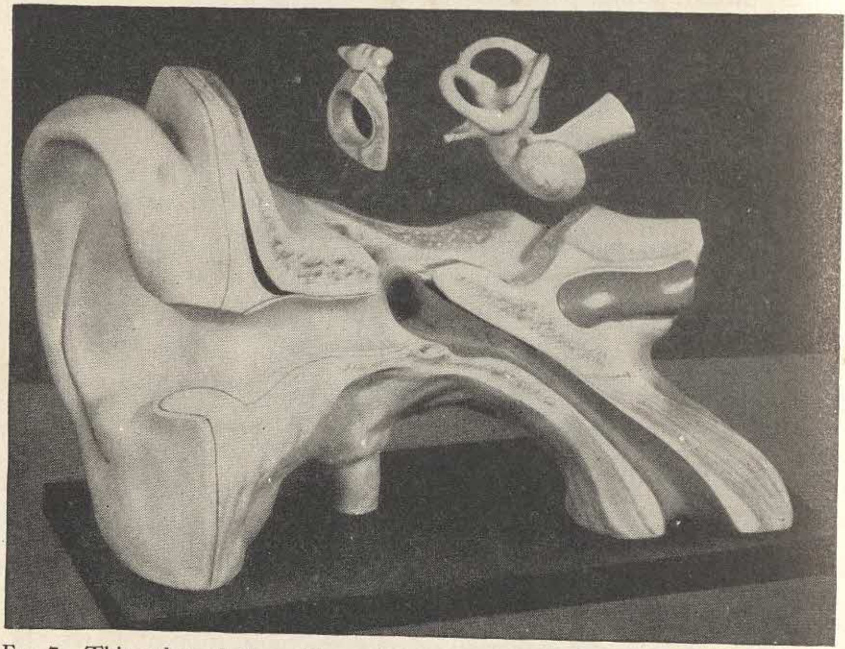

FIG. 7. This enlarged dissectible model shows 21 details of the human ear, each identifiable from the key sheet. (*Central Scientific Company.*)

Soil is shown by pebbles, sand, and sifted earth on glue; irregular heights by plaster of Paris on pieces of propped up screen; grass by hemp, bristles, flax, dried grass, or excelsior glued in holes in the base and properly trimmed and colored; trees and shrubs cut from sponges or constructed of twigs and glued-on paper leaves. Insects, and even birds and beasts, can be suitably set, mounted, or suspended. A painted background, preferably semicircular in shape, helps to give a very realistic appearance to the group. The exhibit should be placed in a covered and glass-enclosed case and may, if desired, be electrically lighted.

Similarly, such other exhibits as these may be developed: Eskimo village (snow is made by spraying melted paraffin), Indian village, primitive village, aquarium (dry aquarium with frogs and suspended fish and tadpoles, and plants, sand, rocks, bugs, and so on), soil erosion, irrigation projects, models of famous buildings or groups of buildings (made from plaster of Paris on built-up frames of lollipop or other small sticks, pieces of wicker, and plaster of Paris, plasteline, wax, paraffin, or putty models of fences, animals, men, walks, stones, and so on), and relief maps.

Labeling. An exhibit must be suitably labeled in order to be most meaningful. The better these labels are, the more interesting and helpful the exhibits will be. Therefore, a considerable amount of time may very profitably be spent in planning and executing them. A good label must, first of all, be self-explanatory. Although it should be accurate scientifically, insofar as this is necessary, the description should be reduced to its lowest terms. As a matter of fact, scientific names are now omitted in the newer museum exhibits designed largely for pupils. The label should be neatly written, preferably typed, or printed (letters printed by hand). The label should be brief, and it should be located where it does not cover any important part of the exhibit and where it can be easily read by children of all sizes. In any and all cases the label should be such as not to distract attention.[15]

Location and display. The school museum is not completed when the exhibits have been made and labeled; the exhibits must be located accessibly and displayed attractively if they are to become effective educational agents.[16] Exhibits are designed in order that they may be seen and used, and, consequently, a favorable location is necessary. The exhibits may be (1) placed in the corridors, provided there is sufficient room and light; (2) in the library or other centrally located room; (3) scattered around in the various classrooms; or (4) located in a special wing of the building or in a separate building. Under certain conditions all of these locations might be satisfactory. The main thing is to locate them where (1) the pupils can see and use them easily and without formality; (2) they can be used without disturbing other pupils and teacher; (3) they can be easily moved, if necessary, to the various classrooms; (4) they are suitably protected; and (5) they can be grouped to represent an artistic addition to the school's equipment. Facilitating their use will also facilitate learning.

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[15] See Bryan Emmert, Inexpensive Lettering Aids for Teachers, *Educational Screen*, vol. 18, pp. 94, 96–97, March, 1939.

[16] A pertinent discussion of the details of plan, illumination, and layout will be found in Hoban, Hoban, and Zisman, pp. 292–295. (See Selected References at the ends of chapters when complete publishing data are not given in footnote.)

Cooperation with public museums. Most of the museums of an earlier day were the outgrowth of the collecting hobbies of the rich.

FIG. 8. "Now watch what happens," is an unnecessary injunction to these seventh grade pupils of S. M. Inman School, Atlanta.

Even in this country more than one of our present-day public museums was originally a private collection. However, owing principally to the efforts of Buffon, Lamark, Guvier, Linnaeus, and others, dating from about the middle of the eighteenth century, the museum idea began to be recognized and accepted in professional educational circles. As a result, today the exhibits of our private, municipal, state, and national museums are viewed and used by millions of people each year. Increasingly, these exhibits are being made easily available to pupils.

The modern museum is not a depository but an educational institution; no longer is it a "passive or static agent of instruction, disseminating knowledge chiefly to the more or less casual visitor (and) concerned with the preservation of records, scientific and historical. . . . The modern museum now stands as an aggressive force in education."[17] Many of these museums lend (often for a week or two) exhibits and materials (usually in specially constructed portable cases and frequently delivered by their own trucks),[18] provide lectures (personal, printed, or sound film), give counsel and advice, hold classes for both pupils and teachers, and cooperate with the schools in other ways.[19] This cooperation is very profitable to the pupils because of the wealth and quality of the material available and the expertness of the museum staff. Too, it helps to develop cordial relations and thus encourages and stimulates the pupils, both as children and as adults, to make further trips to the museum. This work, which is designed to correlate closely museum service with the curricular and extracurricular purposes, activities, materials, and methods, will develop still more as school and museum administrators recognize, appreciate, and capitalize on the opportunities.[20]

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[17] G. H. Sherwood, The School Service of the American Museum of Natural History, *Visual Education Magazine*, February, 1922.

[18] The museum Loan Service of the Illinois State Museum at Springfield is a good example. A wide variety of exhibits are loaned to Illinois schools, usually for a period of 2 weeks, at no cost except transportation. These exhibits include mounted birds and animals, rock and mineral sets, fossils, transportation models of all kinds (scores of scale models of airplanes are available), three-dimensional window-sill dioramas, costume dolls, photographs, photostats, charts, lithographs, slides, and so on. A mobile unit outfitted with an amazing array of exhibits has recently been added. Eventually, the museum hopes to send four of these Museumobiles out on the road. A magazine, *The Living Museum*, is sent each month to those who request that their names be placed on the mailing list, and today thousands of copies are being used in classrooms throughout the state. Other free publications are also available to teachers and schools. In the November, 1943, number of the *Journal of the National Education Association*, Mrs. Mark E. Vance, Director of Art Extension, University of Nebraska, describes her experiences with traveling art exhibits.

[19] The Museum of Science and Industry, Chicago, encourages visits by sending early in September to all public, parochial, and private elementary and high schools in the metropolitan area a booklet of school tours for each month of the year, and later, an expanded announcement each month.

The American Museum of Natural History, New York, holds an annual Audio-visual Aids Institute, which is always attended by a large group of school administrators, audio-visual directors, and teachers. The programs of this two-day session regularly include demonstrations participated in by elementary and high-school students, the showing and judging of school-made motion pictures, and the awarding of an "Oscar" (see footnote, p. 214). A description of the fourth annual event will be found in A Museum's Audio-Visual Aids Institute, Irene F. Cypher, *School and Society*, vol. 67, pp. 316–318, Apr. 24, 1948.

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[20] Two excellent books to read in this connection are E. M. Moore, "Youth in Museums," University of Pennsylvania Press, Philadelphia, 1941, and G. F. Ramsey, "Educational Work in Museums of the United States," The H. W. Wilson Company, New York, 1938.

[21] See also the references on School Trips and Tours, pp. 278–280.

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The Museum Journal is published at the University of Pennsylvania, Philadelphia. Many of the larger museums publish booklets, pamphlets, and other material that the teacher and her pupils will find helpful.

5

GRAPHIC MATERIALS

I: MAPS AND GLOBES

General introduction. The sensory aids discussed in the previous chapter vary considerably in degree of concreteness or abstractness, but even those that can be classified as somewhat abstract are essentially concrete because they reflect more or less naturally such elements as form, mass, height, weight, size, time, temperature, motion, action, and light, and several of them provide experience through more than one of the senses. We now come to a consideration of some visual aids that are much more abstract because they contain very few of these concrete elements and, with but few exceptions, provide experience through sight only.

In these visual aids, which are commonly designated as graphic materials, ideas, objects, and principles are represented pictorially by lines, colors, figures, and numerals. For example, a map, graph, chart, cartoon, or diagram reflects something that would be impossible or impracticable for the individual to experience in reality. Even such conventionalized representations as #, $, %, &, —, +, ÷, and × are timesavers and spacesavers.

Usually these graphic representations are highly symbolic. In themselves they mean little or nothing. Like the words of a foreign language they must be translated into the realities which they portray before they can be understood. As in the teaching of a foreign language, the student must be taught the meanings and applications of these symbols.

When the representation is planned, the representer selects those items which he wishes to show or the emphases which he desires to make, always relatively few, eliminates or subordinates nonessentials, and presents these few boldly, vigorously, and often dramatically. In some types, notably the cartoon, he frequently distorts and exaggerates in order to make his presentation the more striking and the more easily understood. Usually these representations are two dimensional only. Many of them can, of course, be projected effectively either in their original form or from films, filmstrips, and slides.

The present chapter will consider maps and globes, and the following chapter will discuss graphs, illustrations, posters, and cartoons.

MAPS

Man is map-minded; he could not live if he were not. Maps are absolutely indispensable to his existence. From the time when, as an infant, he first begins to experience things around him—persons, chairs, tables, doors, windows, animals, and so on—and notes their size, location or position, differences, relationships, and meanings, up to the time of his death, he is continuously making and using maps, either mentally or graphically. To many adults a map means a sort of colored poster hanging in a classroom. This conception is fairly accurate only when the formal map is thought about. It is far from accurate and complete when the map idea in its entirety is considered.[1]

As we shall consider them here, maps are graphic representations of the surface of the earth, or particular sections of it, showing the relative size and positions of the parts represented. They vary widely in type, form, subject, dimensions, and color. Directly and indirectly maps reveal an enormous amount of information—sizes, shapes, and locations of areas, distribution of peoples, land, water, animal and vegetable life, climate, economic resources, and other natural phenomena, and the associations of these many elements. Little wonder that maps have been called the "encyclopedia of man's existence."

As educational devices, maps help the pupil to visualize and localize important world realities, which he could never realize, understand, or appreciate from written or oral descriptions or even photographs, and which he could never even see himself because of the number and extensiveness of these elements and their complicated relationships. The map, as a record of spatial concepts, tells a story as nothing else can tell it. Naturally, then, pupils must be taught to read these stories intelligently.

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[1] A recent development of the map idea is the kit, a packaged unit that includes a variety of visual aids. Foley & Edmunds, New York, markets several types of visual kit that can be used to good advantage in geography and other subjects. For example, Kit No. V-076 on Australia consists of 3 charts in color, 3 filmstrips, 24 pictures, a base map, a symbol set, and a teacher's guide.

Maps, which are used more than most other types of visual aid, have always been in our schools, but those of an earlier day were limited in number and variety, highly formal in presentation, and were, consequently, very abstract. They were used almost entirely in connection with group instruction in geography and history. Now, many maps and many types of map, much more artistic and meaningful, are used for both group and individual instruction. They are utilized in connection with almost every subject in the curriculum. They are being used more intelligently and more effectively than ever before.[2]

TYPES OF MAP

The globe. This type of map (which can also be classified as a model) is more accurate than the flat map because it actually resembles the earth in shape and water and land masses are shown in proper relative sizes and positions.[3] When a spherical or three-dimensional representation is translated into a flat or two-dimensional map, distortions are inevitable. In addition to depicting the relative sizes and relationships of the world's geographical divisions, the globe can be used to show clearly the earth's movements, to demonstrate changes in time, and to teach the meaning of latitude, longitude, and other pertinent basic facts and principles.

The main weaknesses or disadvantages of the globe are, first, the small size of the representations of the individual parts of the world; and second, the difficulty of translating back into reality the dimensions of the miniature world. Despite these drawbacks there is a place in visual instruction for the globe. In fact, nearly all teachers

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[2] Such questions as the following will help a teacher or group to evaluate a map that is being considered for school use: Is the title clear enough to be immediately understood? What is the date of the map? Is it large enough to be easily read? Does it include the material necessary for its proposed use? Does it appear to include too much material? Are the names and other designations distinct enough to be read easily? Does it include a key? Is the coloring accurate? Are the color combinations attractive? Is it printed on substantial stock? Can maps of particular areas be hung side by side for comparative study? Does it include insets? Do the insets represent usable material? Is the producer reliable?

[3] A pertinent article is O. P. Starkey, Maps Are Liars; Only Truthful Representation of the World is a Globe, *Science Digest*, vol. 13, pp. 6–12, January, 1943.

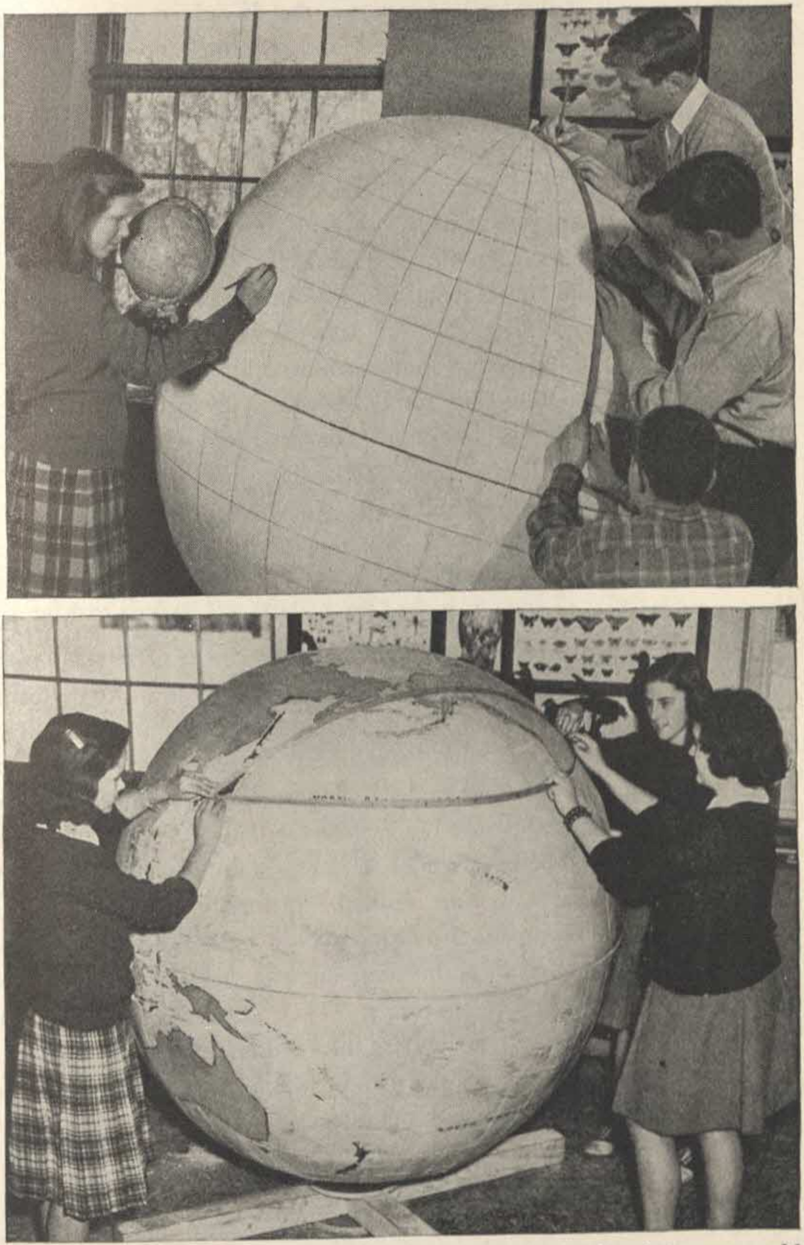

FIG. 1. These Glencoe, Ill., young folks are making and using their own world. In the upper picture they are marking lines of longitude and latitude; in the lower, they are measuring the Great Circle Routes. (*Courtesy of John Sternig, Asst. Supt. of Schools.*)

would say that it is absolutely necessary; that if only one map could be provided, the globe should be that one. The use of other forms of visual aid—flat and relief maps, photographs, diagrams and charts, films, and so on—in conjunction with the globe will help to strengthen the weaknesses suggested above.

The planetarium. The planetarium is an apparatus in which the relative positions and movements of the heavenly bodies are shown on the hemispherical ceiling of a room or auditorium. The Adler Planetarium in Chicago and the Hayden Planetarium in New York are our best known examples. Probably few schools will ever have a planetarium of their own (although some have been built by boys of high-school age), but undoubtedly some students will visit one, perhaps even in connection with schoolwork. For classroom purposes a planetarium globe is used. The Trippensee Planetarium[4] is a good example. It shows the relative positions and motions of the sun, earth, moon, and one planet—Venus. It depicts the rotation of the earth and its revolution around the sun and thus illustrates day and night, change of seasons, and eclipses. The Tellurian Globe is a mounted picturization of the earth, which, when set by the simple movement of two indexed points, automatically shows some of the phenomena indicated above.

The relief map. This map is a realistic model of an area in which the inequalities of surface—depressions and elevations—are shown in relief. Because the world is so large and surface irregularities in a model are so small and because the various sections of a sphere are not readily comparable, the relief globe is not used so extensively as the map in which the area is more limited. Naturally, the smaller the area reflected, the more real the differences in elevation appear. Relief must be exaggerated to be brought out effectively, and hence relief maps are only relatively accurate. They are designed to give a general impression rather than precise information.[5]

The physical map. This is a flat map in which the relative elevations are shown by one of these four methods: (1) shading; (2) contour lines, which connect all points on particular horizontal planes or elevations; (3) layer or hypsometric coloring, which, following the plan adopted for the International Map of the World, utilizes blue for the sea, and green, yellow, brown, and red for progressively higher elevations; and (4) hachure. The political-physical globe is also widely used by teachers.

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[4] A. J. Nystrom & Company, Chicago.

[5] This is not true of contour maps, which show the configuration of a surface by contour lines drawn at regular intervals of elevation. A crowding of lines indicates steepness.

The flat map. The more important types of flat map will be classified and considered, first, on the basis of their content and second, on the basis of their general form.

Projections are mathematical grids representing meridians and coast lines and other geographical information. These maps always show areas in more or less distorted form, depending on the size of the total area represented and of the projection. With some the larger the area included, the more distorted are the elements represented. There are numerous world projections. Prominent among world maps are Mollweide's Homolographic, Van der Grinten's maps, Goode's Homolosine, and Boggs's maps. The use of several of these in the upper grades will help to show the principles underlying each and also give a clearer idea of the relative sizes and positions of areas.

Types of flat map according to content. Often several of the following types of map are combined into a single map, that is, the data of several are represented together on one. Increasingly, publishers are producing combinations that include a single main large map with smaller supplementary maps showing different content–all on the same sheet. The most readable of these smaller maps are made on the basis of an easy fraction of the scale of the larger map, such as one-fourth.

Political Map. This map, on which the political units are colored separately, shows the boundary lines of units or countries, the principal cities, rivers, lakes, seas, mountain ranges, and so on. Because of the absence of pictorial elements and representations of environmental relationships this map is very abstract.

Political-Physical Map. This type of map combines the political and the relief-map ideas. It shows the natural environmental forces and relationships that influence man's mode of living, his occupations, and his activities. It is more valuable for school use than the political map because it brings in the related nature elements. It is more valuable than the relief or physical map because it includes human elements.

Population Map. This map shows the distribution of population, usually on the basis of the number of people to the square mile, or other chosen unit of measure.

Economic Map. This, sometimes called a "products," "industrial," or "commercial" map, shows the resources or chief industries of the various areas—agriculture, lumbering, mining, manufacturing, and so on. The specialized economic map shows the distribution of the various forms of a particular industry. For instance, an agricultural map of the United States shows the areas in which the various types of farming—corn, wheat, cotton, tobacco, tropical crops, hog, cattle dairying, and so on—are most common.

Rainfall or Precipitation Map. By means of shading and other devices this type of map indicates the approximate amount of rainfall or precipitation in the various parts of the country or in the entire world, and this, in turn, helps to explain soils, vegetation, crops, products, industries, and distribution of people, as well as man's activities in each of these sections.[6]

Temperature Map. This map shows the geographical distribution of temperatures and, like the rainfall map, helps to explain the influence of environment on man's life. The implications or relationships of latitude, longitude, altitude, winds, proximity to bodies of water, and general climatic conditions are also brought out.

Soil and Vegetation Maps. The soil map, usually colored, shows the distribution of the various kinds of soil—swamps, grasslands, deserts (dry, cold), rock, and so on. The vegetation map shows types of vegetation. Both of these maps reveal the influence of soil and vegetation on man's occupational pursuits.

Road Map. This easily available and very readable adjunct of modern civilization contains a great deal of practical material and up-to-date information concerning cities, states, landmarks, memorials, routes, scenic beauties, natural phenomena, climate, topography, vegetation, occupations, history, literature, and other items of interest and value.

Other Specialized Maps. Illustrative of other specialized flat maps are history, which shows military invasions, campaigns, and conquests, exploring expeditions, territorial accessions and expansions, and the development of cities, states, and empires; literary and music, which reflect environmental influences in the lives of authors and composers, as well as in their characters, settings, stories, and music, and authors' and composers' trips and travels; health, showing the prevalence of disease, frequency of accidents, and the location of institutions and services; language, locating nationalities or language-speaking groups; and religion, which depict the regional origin, development, travels, and present locations of groups or organizations.

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[6] Other types of weather and climatic maps are concerned with pressure, ocean currents, climatic regions and types, yearly isotherms, and yearly isobars.

Types of flat map according to form. On the basis of method of presentation and use maps may be classified as indicated below. Some of these forms are more appropriate for the presentation of certain materials than others, and also, some of them are more suited to individual than to group instruction.

Outline Map. There are two types of the outline or base map, sometimes called the "project" or the "problem" map, and these are similar in general form but differ in size and, therefore, in class use. The larger or blackboard map[7] is used for group instruction, while the smaller or desk map is used individually by the pupils. The outline is really a skeleton map. For instance, the geographical outline map shows only the most important outlines or political divisions, rivers, and bodies of water. The pupils fill in the details. Usually the main part of the map is black, and the lines are white or yellow. The filled-in material may be erased and the outline used again and again. In one form of desk map the outlines are printed on paper, and each map can, of course, be used but once. This map offers many fine opportunities for pupil activity of the project, examination, and other types. Other examples are the music staff, which shows only the lines and spaces, the graph, which shows only the grid, and the bookkeeping, which shows only the horizontal lines and the columning.

Completed Wall Map. This map, usually hung on the wall or mounted on a stand, is used primarily for group instruction. It is comparatively free from confusing details, reflecting chiefly information or data of major importance, and is usually large enough to be read by the average pupil seated at the rear of the room.

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[7] Large maps may also be projected. See footnote, p. 190.

Projected or Enlarged Map. Maps may be thrown on the screen from slides or filmstrips or by the opaque projector. Even outlines for the pupils to trace can be projected on the board or on paper.[8] The transparent map is drawn on glass or other transparent or translucent material and placed in front of artificial or natural light.

Sand-table Map. The sand table is often a very convenient device by which simple flat and relief maps for temporary use may be made. Drawn or cutout lines and figures may represent elements, and relief modeling may represent elevations and depressions. The largest possible horizontal scale should be used to avoid errors in construction. Increasing the scale for altitudes will help to show these more clearly.

Electric Map. In an electric map the elements one desires to emphasize—trade routes, railroad or steamship lines, communication systems, cities, mountain ranges, coast lines, bodies of water, specialized industries, models of buildings, natural phenomena, and so on, are illuminated by electric lights placed under or behind them. It is possible for one map to represent quite a variety of these elements, either by the use of different colored lights or by different electric circuits, and thus be utilized in a number of instructional settings. This type of map is also used increasingly in science models and exhibits.[9]

Pictorial Statistics Map. Conventionalized symbols—pictures, photographs, drawings, or prints—are used in this map to represent activities, occupations, natural phenomena, animal life, climatic conditions, industries, products, historical data, and other types of elements. Many of the ancient maps were pictorial but not statistical. The reader has probably seen reproductions of nautical maps in which a drawing of a fish represented the sea.

Confusion in the pupil's mind is often caused by the use of this type of map because (1) the scale of the area is so different from the scale of the objects and (2) the pupil soon discovers that the map is inaccurate; for instance, mining, represented by a miner, excludes

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[8] Projection Drawing by H. F. Hughes (*Educational Screen*, vol. 13, pp. 128–129, May, 1934) is an interesting and detailed description of this type of pupil activity. It is well to note that with certain types of materials this activity represents a possibility of copyright infringement. With government maps there is no such possibility.

[9] A description of how an electric map, showing specimens of butterflies, is made will be found in E. C. Dent, "The Audio-visual Handbook" (rev. ed.), pp. 41–43, Society for Visual Education, Inc., Chicago, 1946. See also L. A. Heathershaw, Simple Directions for Making Visual Aids, *Educational Screen*, vol. 12, pp. 16–22, January, 1933.

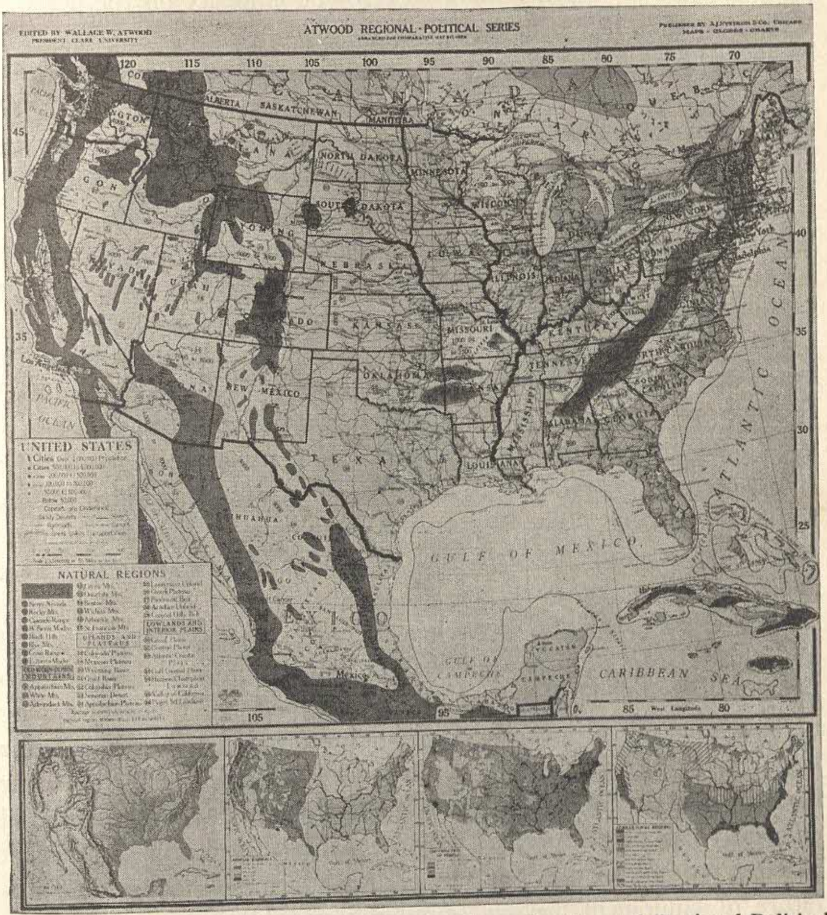
EDITED BY WALLACE W. ATWOOD PRESIDENT CLARK UNIVERSITY
ATWOOD REGIONAL-POLITICAL SERIES
PUBLISHED BY A. J. NYSTROM & CO. CHICAGO MAPS · GLOBES · CHARTS
UNITED STATES
NATURAL REGIONS
GULF OF MEXICO
CARIBBEAN SEA
ATLANTIC OCEAN

FIG. 2. A well-planned and edited map, such as the Atwood Regional-Political map shown above, presents the influence of physical and climatic environments and the resultant patterns of population and land use. Relationships between natural and cultural environments and man's responses are revealed. (*A. J. Nystrom & Company.*)

reflections of other occupations on top of the land, such as farming, fruit growing, or lumbering. Sometimes the second possibility is obviated by the use of more than one figure.

Decorative Map. Increasingly, schools are utilizing appropriate wall space for permanent tiled or painted representations, usually showing political divisions or geographical influences and relationships of considerable local significance. An artistically conceived and executed decorative map may have an aesthetic influence on the pupil as well as provide him with factual data.

Air-age Map. This is a type of map that grew out of the war. It shows land areas as seen from high altitudes and from various angles and distances. The sphericity of the world is clearly shown by the air routes "up and over" and "around" instead of merely "across" as is the case with the usual flat map. Although these maps are frequently found in magazines and newspaper supplements, as yet they have not become common in schools. Perhaps in time they will be as indispensable in education as other types of map.

The atlas. The atlas is a comprehensive geographical encyclopedia including maps of various kinds, pertinent statistical tables, historical accounts, photographs, diagrams and other types of illustration, gazetteers, and other informational devices. In a recent development the atlas is kept perpetually up to date by semiannually published sets of replacement maps. The importance of this development is evident when one considers the fact that every year world changes affect about sixty-four maps.

Pupil-made maps. Some teachers and administrators have criticized pupil-made map projects, pointing out that such experience is too limited to be of any great practical value and too time consuming to represent a good investment of pupil efforts. Doubtless, in some instances, these criticisms have been well deserved. On the other hand, it is as logical to believe that a purposeful, well-planned, and efficiently carried-out project in map making is as valuable as a project in letter writing, picture painting, garden planting, flower raising, furniture or equipment making, scrapbook assembling, newspaper publishing, play producing, or other similar projects commonly promoted by pupils.

There are two types of map-making project, one in which the main emphasis is on the participants' immediate training in map ideas, concepts, relationships, words, expressions, implications, and applications, and the other in which the emphasis is on producing materials for use by other pupils both now and later. Because of its demands for accuracy and high-grade workmanship, this latter type of project represents also a valuable individual educative opportunity. However, the purpose of these projects is never to train professional map makers. Rather it is to provide for the learning of certain important facts and conditions of geography, history, science, economics, occupational pursuits, and so on, in a natural, practical, motivated, and integrated educational setting.

As was pointed out earlier in the chapter, even the infant is a map maker. When he staggers a few steps in his early attempts to walk, he is making and using a map, crude and mental though it may be. Later he learns in a general way the direction of the school and its distance from his home. Upon entering it, he soon learns the position, size, and arrangement of the doors, windows, office, steps, drinking fountain, his own seat, the teacher's desk, and the washroom. All this represents map making and using. Still later, in making school trips, both actual and imaginary, to local and more distant objectives, in helping to construct a model of a bridge, farm, or village, and even in studying his more formal subjects such as reading, he is still making and using maps. He will continue to make and use them as long as he lives. What would be more appropriate, then, than to have him put into more definite shape the principles and practices by which he will always be guided? Such efforts will also help him to understand more clearly and appreciate more completely the contributions of those who have made maps for his use.

The simplest of pupil-made maps is one by which the child shows with a single line the route that he travels to school. In a more complicated form of this he can show the streets used and crossed, carlines, distances, and some or all of the houses and buildings he passes. Another type of simple map is that in which the individual or group sketches the positions of the various objects in the classroom—seats, desks, chairs, teacher's desk, door, windows, bookcase. In an extension of this idea the sketch can show the main elements of the building—entrance, steps, classrooms, corridors, office, washroom, gymnasium, and auditorium, or of the playground—trees, shrubs, gardens, walks, drinking fountains, bicycle racks, fences, apparatus, baseball diamond, basketball court, and other things. From these it is an easy step to the neighborhood map, which shows community outlines, streets, main buildings, bodies or streams of water, bridges, carlines, railroad tracks, cemeteries, and parks. And similarly, later, projects reflecting still larger areas—county, state, nation, and continent—can be undertaken. The simple beginning teaches the pupil the general purpose of maps, develops his spatial imagination, gives him a clearer conception of areas and their relationships, and thus prepares him for further and more technical instruction.

The traced map is made by the pupil tracing an outline over a printed map either on his desk or on an illuminated tracing table or on the shadows cast by slide, film, or opaque projection. It is often both possible and desirable for a number of pupils to cooperate in developing the latter type of map. The projection is thrown on a large sheet of paper placed against the wall or blackboard, and the pupils trace the outlines lightly with pencil, and, when these have been completed, retrace them with crayon, ink, or paint. If desired, pictorial representations may be cut out and pasted on the map or on its margins with lines to indicate their positions in it. Symbolic coloring may also be used. The use of a pantograph also results in an accurate tracing and has the advantage of decreasing or increasing the size while the proportions remain the same as in the original.

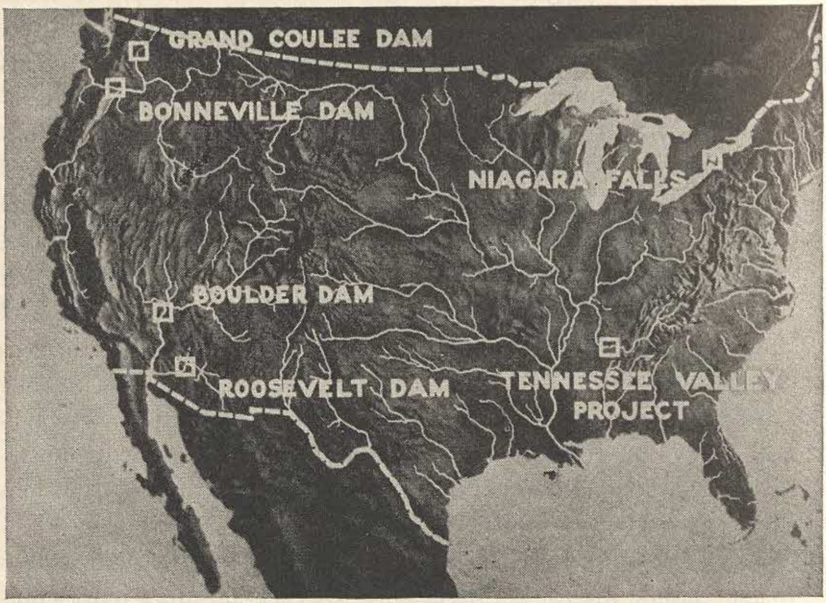

FIG. 3. This relief illustration very strikingly shows the network of the nation's great waterways and the location of important sources of power. (*Encyclopaedia Britannica Films Inc.*)

Although this device can hardly be used by younger pupils, it can be utilized very effectively by the older ones.

Relief maps or terrain models, constructed either individually or by the group, represent another interesting and educative phase of map-making activity. The most logical point at which to begin the construction of such a map is some nearby area where the surface is quite uneven. Preferably it should contain lowlands, highlands, a stream or two, and perhaps a body of water. The pupils, under the direction of the teacher, familiarize themselves with these elements, their respective sizes, elevations, and relationships, plan a scale, lay out the base area, and construct the map out of clay, sand, modeline, plastilene, paper pulp, salt and flour, or other plastic materials.[10] If desired, even trees, houses, bridges, railroads, highways, and other elements may be included. The map or the model may be painted in a very realistic manner. Titles, names, and designations, of which there should be enough but not too many, can be printed with colored pencil, ink, or paint, or pasted in with cutout letters. A rim around the baseboard not only serves to protect the map but also gives it an artistic definition.

Standards for Pupil-made Maps. Although the pupil-made map should not be expected to equal the product of a professional, it should have some caliber, be useful, and also represent a good educational investment of the time and effort spent on it. E. Winifred Crawford suggests the following standards for evaluating these maps:[11]

1. Have the children grown in their knowledge, appreciations, and understandings through making the map as one part of a study?
2. Can the children interpret the meanings indicated by the map and not tell just the obvious?
3. Does the map
   a. Have educational value commensurate with the time spent in making it?

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[10] The usual salt-flour recipe is two parts of salt to one of flour. The most inexpensive material is paper pulp, which is made by tearing up ordinary newspapers, soaking the pieces for two or three days, pouring off and squeezing out the water and working the material into the desired consistency. See reference to Nelson, p. 111.

[11] Pupil-made Maps, "Thirteenth Yearbook," p. 227, Department of Elementary School Principals, 1934. This entire article, which describes how these maps are made and also how they can be used, is well worth reading in this connection.

b. Make clear its purpose to the observer?
c. Indicate that the materials have been evaluated?
d. Speak the truth?
e. Present an artistic appearance?
f. Indicate that efficient techniques have been used?

As implied in these questions, a pupil-made map, even though interesting and spectacular, can be a very expensive device as far as pupil education is concerned, and on the other hand, it can represent the opposite. Usually a map project that is carried out in connection with some subject or activity is preferable to one that is not so intimately tied up with curricular activities. In a word, making maps helps the pupil (1) to get ideas and (2) to express his learning.

Standards for manufactured maps. For several years an international committee of the World Federation of Education Associations has been assembling, analyzing, and discussing essential characteristics of maps, atlases, and globes for the various educational levels, elementary school through college. To date the following standards have been determined. Additional ones are being investigated and discussed.[12]

1. Meaningful titles: Major Wheat Producing Areas of Latin America in 1935.
2. Scale: 1 in. equals 200 miles (accurate or approximate).
3. Key or legend: Each symbol (color, line, letter, dot, circle, and so on) used on the map should be appropriately explained.
4. Grid: a functional network of parallels and meridians either indicated at the edge of the map or drawn lightly across the map.
5. Sources of information from which data shown on the map have been obtained: U.S. Department of Commerce, "Foreign Commerce Yearbook," 1938, or Pan American Union, Washington, D.C.
6. Coast line continued to the edge of the map. For example, on a map of the United States the Canadian and Mexican coast lines should be drawn to the edges of the map.
7. Date: Whenever the information on the map makes it advisable or essential, the date of that information should be given. For example, Population Pattern of Europe in 1940.

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[12] Standards used in the selection of maps are somewhat similar to standards used in the selection of pictures. These will be found on p. 147. A good reference is A. G. Eldridge, and others, Maps and Map Standards, "Thirty-second Yearbook," pp. 394–405, National Society for the Study of Education, 1933.

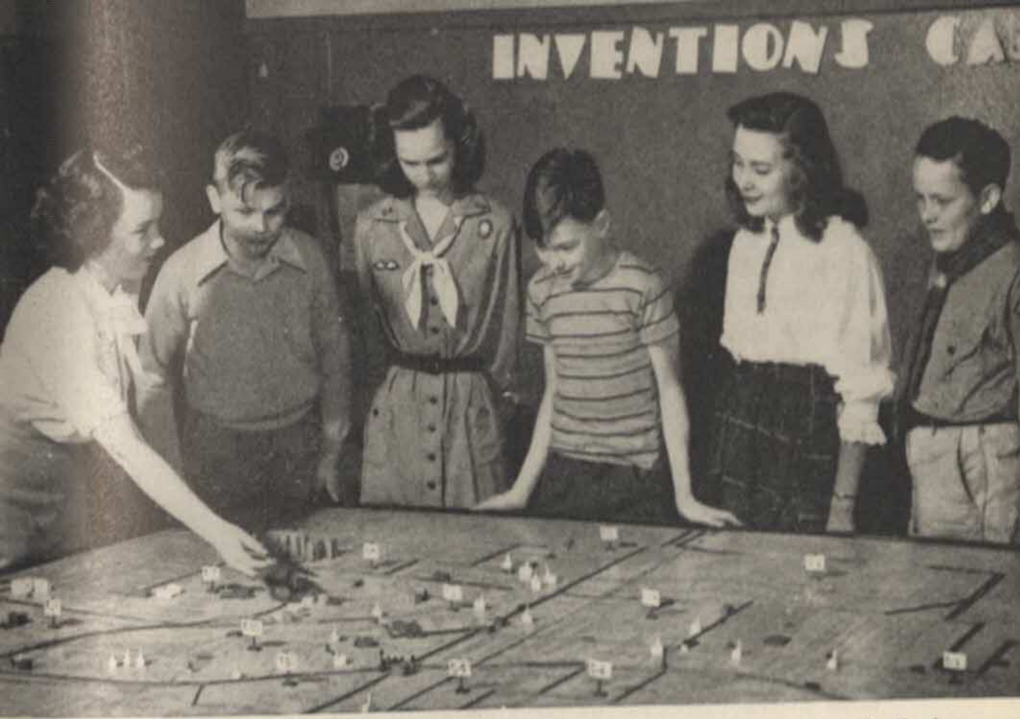

Fig. 4. These students at Bass High School, Atlanta, Ga., are using a map to plan distribution of the National Blood Program literature. (*Courtesy of American Red Cross.*)

If these characteristics are essential to good maps, then no drawing not possessing them should be labeled a map. Rather it should be designated a pictorial diagram or a diagrammatic sketch.

Preserving and filing maps. Since maunfactured maps cost money, those that are to be used more than once should be suitably protected from moisture, dust, misuse, and other careless handling. Some types of rolled fabric and paper maps and map sets come in cases[15] that may be hung where they do not interfere with the use of the blackboard, bulletin board, or other equipment. Rolled but uncased maps may be suspended horizontally on hooks or notched pegs. Such maps should never be piled on top of each other. Pupil-made maps and those that are not equipped with rollers may be fastened onto window-shade rollers or on wooden dowels that may be inexpensively purchased at any lumberyard. Smaller maps, preferably mounted on some form of stiff cardboard and varnished or lacquered to keep them from being soiled, can be filed in shallow drawers or in the compartments of a filing cabinet. Globes and stand or tripod maps, when not in use, should be placed where they will not be shoved or knocked about, stumbled into, or needlessly moved and re-moved. During the longer periods of disuse, such as vacations, globes should be suitably covered. In order to make the maps easily available and to avoid unnecessary handling and unrolling, all maps should be clearly labeled with the title or the specific nature of their content and the grades in which they can be most appropriately used. Maps should be kept in good repair; the edges and the spring (in roller maps) require special attention.

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[15] A disadvantage of nonremovable cased maps is that it is difficult to use more than one map at the same time.

A great variety of types and sizes of filing and mounting equipment—tripods, stands, cases, cabinets, rollers, holders, and hangers—can be purchased from almost any map-publishing company. If it is impossible for the school to buy these, the older boys and the teacher or the shop department of the school can make the simpler forms, getting the necessary basic ideas and plans from the pictures and descriptions in the catalogues of the commercial map companies. If this pupil-made equipment is carefully designed and attractively constructed and colored, the pupils' emotional attitudes will be more conducive to happy learning than if the maps are wrapped around sticks or sawed-off broom handles and carelessly thrown onto a shelf or into a closet. And the maps will last longer.

Utilizing maps as visual aids. In order to capitalize on them most effectively the pupil must be taught to use maps as he must be taught to use any other educational device or material. Nearly all the suggestions made on the teaching of pictures (pages 149–153) also apply to the teaching of maps, and these need not be repeated here. The following additional suggestions are pertinent:

Make Sure That the Pupil Comprehends the Purpose of the Map. First of all the pupil must be taught the purpose of the map—what it is for, why it is necessary, and how it is used. This basic concept must be taught in the lower grades of the school. It can be taught, as indicated previously, by having the pupils draw simple maps of their routes to school, the arrangement of the elements of the classroom, building, playground, and the general community. Through such personal projects the map idea becomes meaningful, real, and vital. The formal maps used, preferably the political-physical, should be about as simple as those the child himself makes. As he becomes older and learns more about man and his environment and activities, the other types of maps, such as rainfall, population, temperature, economic resources, and so on, become a necessary part of his learning materials because they help to explain these items. In short, the pupil must very early be taught that a map is a device that will help him to answer many important questions concerning himself, his family, and his friends. He must appreciate the map as a personal device.

Promote the Development of a Favorable Emotional Attitude. A favorable emotional attitude or mind-set toward maps must be developed. In general, when a pupil looks at a map for the first time he may (1) be discouraged or dismayed by its confusing-looking details; (2) be attracted by its uniqueness, colors, or other characteristics; or (3) recognize that it offers answers to his questions or solutions to his problems. Obviously, the third of these possibilities represents the attitude that must be developed.

Almost any map is a complicated and abstract composition of symbolic lines, masses, colors, and other elements, and, therefore, it may be very confusing to the pupil who hurriedly attempts to understand it. If he fails to see meaning in it immediately, he is quite likely to experience a sense of failure and, consequently, discouragement and thus erect a mental barrier against it that will be anything but helpful in his required consideration of it. If this reaction is felt once, it is felt all the more easily in subsequent experiences with maps. Of course, out of these reactions grows an antipathy toward all maps in general. The lesson here is clear: the pupil's first experience with a map must be highly successful; he must get something from it and be thrilled over his personal achievement. This most certainly means that only simple maps, which are easily understood and interpreted and thus mastered by the pupils, should be used at first.

Allow Ample Time for the Pupil's First "Looks." Doubtless, the pupil will be considerably thrilled by the new map with its unusual delineations and coloring, especially if it is very attractive, and this reaction, unless recognized and capitalized, may actually handicap his learning from and with it. As suggested in the section on pictures (pages 149–153), the pupil must be given plenty of time for a good first look in which he superficially surveys the entire map and a good second look in which he centers his attention on the elements in it that for one reason or another appeal to him. No concentration on the teacher's points is possible until the pupil has had both of these "looks." Hence it cannot be overemphasized that these first experiences must be unhurried and informal.

Make Sure the Pupil Understands Map Symbolism. Because the map is a form of expression like a sentence or paragraph, the pupil must be taught to understand the conventional symbols of its practical elements—land, water, elevations, roads, bridges, and so on—as well as its hypothetical elements—poles, equator, circles, parallels, meridians. Further, he must be led to appreciate the relationships of these to seasonal and time changes and climate and these in turn to man's life and activities. To learn to associate these locational facts with human activities is no easy task; consequently, here again, plenty of patience and time is necessary. Leading the pupil in his attempts to visualize the abstract must not be done in high-pressure fashion; not too many symbols should be introduced at any one time. An abstraction of which he does not have a correct mental image, even though he can glibly define it, is still an abstraction; it means nothing to him.

The pupil must not only understand the symbols on the map, he must see beyond them. He must see beyond the dot that represents London, the wavy line that represents the Mississippi River, or the colored patch that represents lowland France. These are still abstract and meaningless symbols until he sees peoples producing and consuming, working and playing, living and dying, and understands how and why they produce, consume, work, play, live, and die as they do. He must read himself into the map as a sort of visitor or traveler before he is able really to interpret it properly and beneficially. In fact, taking imaginary trips with the early and later explorers, as well as with his group to the various parts of the modern world, will help to give meaning to maps and make them more useful.[14] The liberal use of other aids—photographs, pictures, stereographs, slides, films, graphs, and posters—will help to explain, enrich, and supplement the map and in this way facilitate more happy and satisfying "travels."

Use Maps at the Opportune Moment. The map should be used when it is most needed to answer questions, solve problems, or supply information or data. It is not something to be taught apart from subjects, but like an experiment in science it is an integral part of the work in a subject. In such a setting it becomes meaningful and functional. Studying a map apart from such an actual situation easily becomes an academic or artificial stunt or chore—a sort of busy work—that lacks purpose and life. Such useless study will discourage the development of a favorable attitude toward map work.

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[14] See p. 258 for a discussion of imaginary trips.

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6

GRAPHIC MATERIALS

II: GRAPHS, ILLUSTRATIONS, POSTERS, CARTOONS

In addition to maps and globes, there are a number of other types of "picture writing"—graphs, diagrams, illustrations, posters, cartoons, comic strips, and so on. These, too, are drawn, traced, or printed on flat surfaces and either used in this form on the desk, blackboard, or bulletin boards, or projected onto the screen. All of these types of symbolic representation have their proper place in instructional procedures.

GRAPHS

The graph is a more or less accurate representation of quantitative data and is widely used in showing comparisons, trends, developments, and relationships. Even at best, statistical data are somewhat confusing and discouraging, and the function of the graph is to present them clearly and interestingly. The most commonly used types of graph are the pictorial, line, bar, area, and diagram.[1]

Pictorial graph. This type of graph, often called "pictorial statistics," is attractive because it is pictorial in form, and it is easily understood because fundamentally it is so simple. In fact, it has often been called the "international statistical language." In it a number of quantities or elements, varying from one to billions, are represented by a basic self-explanatory and appropriate symbolic figure—cow, automobile, man, ship, railroad car, or bale of cotton—and the total quantities are shown by the proper number or multiples of this symbol. A key indicates the numerical value of each unit. Titles, legends, labels, and textual explanations are used to define the general field, the pictorial representations, and the other elements included. Numerous ingenious forms of the picture graph have been devised, such as animated or demountable charts, maps to which symbolic items may be pinned or hung, and magnetic charts to which these symbols are held by magnetism.

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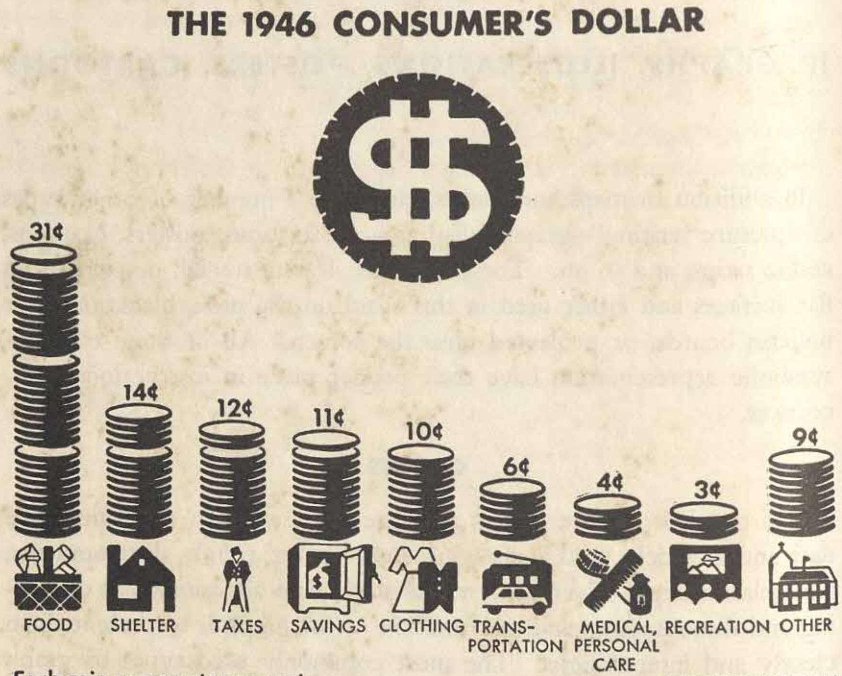
[1] A combination map-graph, often used, is made by superimposing a graph on a map.



Each coin represents one cent.

PICTOGRAPH CORPORATION

FIG. 1. This pictorial representation is much more interesting and meaningful than a column of percentages. (*Pictograph Corporation.*)

This graph is valuable in giving general, round-number impressions of quantities for comparative purposes. It is not designed to show accurate measurement. From its simplest form, in which each symbol represents one unit, to its more complex, in which each symbol represents a large number of units, this type of graph is used in a great variety of settings to teach and show number concepts and their interrelationships. Here again, the simpler forms can be easily and enjoyably made by the teacher and her pupils.

Line or curve graph. This is one of the most accurate forms of the graph. It is made by determining on a grid, represented by vertical or horizontal lines showing two scales of values, the points that denote the various values to be represented and then connecting these points. The two scales of values are usually placed at the left and the bottom of the grid. The line graph is widely used in the industrial and commercial world because it shows trends, which include the elements of time and quantity, very clearly. If several curves are shown on the same grid, they are usually made in different types of lines or colors in order to differentiate them, a key being used to define each. Special care is required in teaching this graph to make sure that the pupil both understands its meaning and appreciates the significance of the data shown. One good way to teach the basic principles of the line graph is to have the pupils keep records of such things as daily temperature or their daily marks and make graphs of these.

Bar graph. This is probably the simplest and most easily understood type of graph. Broad lines, bars, or narrow rectangles are drawn to indicate the values, in terms of a common scale, of the various items charted—distances, weights, heights, sizes, quantities. All of these bars start from the same base, which generally represents zero. The bars may run either vertically or horizontally. The latter are usually more easily read because the pupil reads them naturally, from left to right, as he does the text on a printed page. The scale of values is placed at the bottom in a horizontal, and at the left in a vertical, arrangement. Although it may add a distracting element, these parallel bars may be colored, crosshatched, and differentiated in other ways. The two possible weaknesses or disadvantages of this type of graph are (1) the units on the scale may be too large for the pupil to obtain any more than a general idea of the comparisons and (2) if the scale used is small, the bars may be so nearly the same length that relatively little difference is shown. This is another type of graph that can be very easily made by the pupils themselves.

Area graph. In the area graph differences in quantity are shown by differences in the size of the areas that represent these quantities. There are two main forms of this graph, the circle or pie chart and the areal figure.

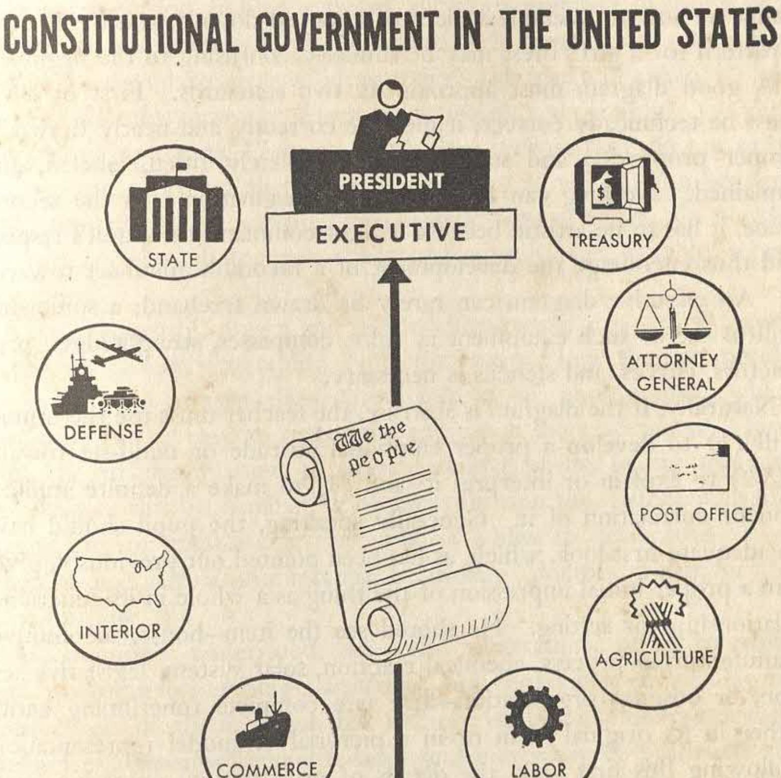
In the pie-chart type the divisions, usually represented by means of color, crosshatching, or shading, represent percentages or proportional parts of the entire circle area. Although this graph is designed to represent a general idea of the relative size of the quantities rather than technical accuracy, the exact percentages and even the numerical values may be written onto each segment. This graph is commonly used to give pupils their first experience with the larger fractions—halves, quarters, and eighths—because it is easy to teach the relationships of these parts to the entire circle by drawing in the segments, and also by cutting them out, comparing them by laying them on top of each other, and reassembling them.

In areal figure graphs, separate figures—circles, squares, or rectangles—are used to represent the different quantities. Obviously, because these figures are not proportional parts of a whole and also usually are not superimposable on each other, this form of graph is rather difficult to understand and interpret. It has the possible advantage of being pictorial, but even this is no real advantage unless the facts depicted are lucidly shown. If multiples of the basal areas are used, the proportions may be a bit more clear.

DIAGRAMS

Because it can be used advantageously in conveying ideas, the diagram is probably the most important of all types of graphic representation. From the rough one-line sketch drawn in the dust of the road to show the location of a certain individual's house to the hundreds of carefully drawn sketches that together represent the plans for a great ship, skyscraper, bridge, or machine, the diagram is an indispensable device for showing the arrangement and relationships of the essential elements of a setting, device, or process. It is commonly used by the teacher in her blackboard explanations and by the pupil in his paper expositions. Even many gestures, especially those denoting direction, size, height, relationships, power, and force, are fundamentally but pantomimed or dramatized diagrams.

The diagram is one of the most complex, perhaps the most abstract, of graphic representations because an understanding of it depends upon so many varied symbolic elements. To an individual who has never seen one before and who, consequently, does not know how to read or interpret it, even a simple blueprint is a very complex thing. To the individual who lacks the proper background of experience or knowledge, a chemical reaction or a mathematical formula is unintelligible. A simple diagram that shows how to hook up an electric door



PICTOGRAPH CORPORATION

FIG. 2. The pupil who looks at this chart should immediately recognize the three main elements of our government and understand their relationships. (*The Macmillan Company.*)

chime or how to assemble a piece of knocked-down furniture or even a pattern for a girl's dress may be similarly confusing to the beginner.

A good diagram must approximate two standards. First of all it must be technically correct; it must be correctly and neatly drawn in proper proportion and suitably and completely titled, labeled, and explained. Nothing can be left to the imagination. In the second place, it has to be artistic because it must command the pupil's respect and thus encourage the development of a favorable mind-set towards it. An effective diagram can rarely be drawn freehand; a somewhat skillful use of such equipment as rules, compasses, straightedges, protractors, curves, and stencils is necessary.

Naturally, if the diagram is abstruse, the teacher must use the utmost skill (1) to develop a proper emotional attitude or mind-set toward it; (2) to explain or interpret it; and (3) to make a definite application or correlation of it. Generally speaking, the pupil should have an adequate first look, which, as has been pointed out previously, gives him a proper initial impression of the thing as a whole in its functional relationships or setting. He should see the item—house, locomotive, manufacturing process, chemical reaction, solar system, legislative session, or business organization—first as a complete functioning entity either in its original form or in a pictorial or model representation. Following this first look, the details of organization, operation, construction, and relationships can be shown more easily, and they will be the more meaningful. This is the so-called "psychological" approach in learning. The use of other types of aid, graphic as well as pictorial representations, will be found helpful in conveying a complete and accurate conception of the diagram. Very often several simpler diagrams other than the original under consideration can be advantageously utilized to explain it.

ILLUSTRATIONS

Genetically, anything used to clarify meaning is an illustration. For our purposes here illustration means a graphic or pictorial representation, either realistic or symbolic. In its realistic form it is a sort of model, reproduction, or representation of what has come to be accepted as the original. A photograph is usually a more or less accurate representation, but some things, such as a primitive man or a prehistoric animal, cannot be photographed. However, from one source and another we have derived ideas of how this man and animal looked and can, therefore, now represent them probably accurately. We cannot photograph Santa Claus or Uncle Sam because they do not exist; but we can represent them graphically, that is, we can use symbols that have come to be accepted as representations of them. Of course, we can and do photograph other photographs and graphic representations.

Very frequently, drawn and painted illustrations can be used more effectively than photographs. Note for instance how the commercial advertiser uses drawn illustrations instead of photographs, which would be just as easy to reproduce and much more accurate. However, the advertiser wants to stress certain elements in his products, and he does this by eliminating or subordinating the nonessentials and magnifying or emphasizing the ideas he wishes to get across. Even when he uses actual photographs, he usually "doctors" them for this same purpose.

As commonly understood, the term "illustration" refers to paintings, photographs, etchings, drawings, and engravings, or graphic reproductions of them, which tell a more or less complete story by themselves. Because these are easily and inexpensively produced, the pupil has at his command a great array of excellent materials that he did not have a few years ago. But this is only one type of illustration. A second type is verbal and not pictorial in character. Good examples are chapter and paragraph headings and textual footnotes. The difference between these types is easily recognized. The purpose of the first type is to give a better understanding of textual materials; the purpose of the second is to center attention on the textual material, or define it, and thus develop a comprehensive and receptive mind-set towards it.

Pictorial illustrations are still pictures and as such can be selected largely on the basis of the criteria suggested in connection with these. They can also be used in much the same way. Consequently, there is no necessity for a repetition of these standards and methods of use. They will be found on pages 147, 149*ff*. The discussion of textbook illustrations on pages 144–146 is also pertinent.

CLASSIFICATION CHARTS

Several of the aids discussed in this chapter, such as maps, graphs, diagrams, and cartoons, are types of charts. However, there is another group of these devices, which, for want of a better and more accurate name, we designate as classification charts. These are analytical in nature; they depict the sequential arrangements or interrelationships of their various elements. The three most commonly used types are the table, the genealogical, and the flow chart.

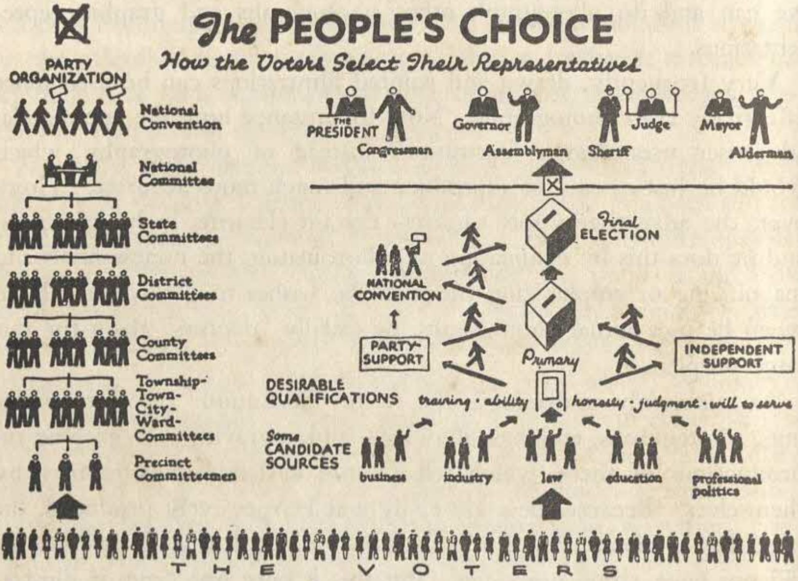


FIG. 3. This pictorial wall chart clearly presents relationships which, when merely described, are somewhat difficult to understand. The original chart is in two colors. (*Denoyer-Geppert Company.*)

Table chart. The railroad timetable is a good example of this type of chart. In it the various cities or stopping places are arranged in proper order, and the time at which the train stops at each is indicated. The chronological chart, which lists in their properly dated sequence great inventions, discoveries, explorations, acquisitions of territory, wars, developments, presidential administrations, and other events and data, is another example. Slightly different from these are such charts as a typical financial record showing gains and losses and a report showing a comparable list of advantages and disadvantages of a process, machine, product, or other item. The use of titles, labels, columns, lines, arrows, numerals, colors, large and small and light and heavy type, diagrams, illustrations, pictures, maps, appended explanatory notes, and other devices help to clarify the material and make it more readable and meaningful.

Genealogical chart. Growth or development is shown by this type of chart. In the tree form the origin is a single line, rectangle, circle or other representation of the trunk, and the various changes or developments are shown as the branches. Two examples are (1) the development of a single store into a nationwide chain of stores and (2) a pedigree in which ancestral descent from two individuals is depicted. In the stream type this order is reversed, the origin being represented as small tributaries, which unite ultimately to form the single stream. Two examples are (1) a chart showing how the various accretions of American territory finally resulted in the United States as it is today and (2) a chart showing how the discovery or invention of various principles, forces, and devices finally resulted in the airplane or the radio.

Flow chart. This chart shows organizational elements and their functional relationships. Examples are the charts showing the various legislative, executive, and judicial departments of the government and their interrelationships, and the organization of a board of education, political committee, newspaper staff, or city administration. The various elements, properly named or designated by lines, rectangles, circles, or other graphic representations, are connected by lines showing the directional flow of the organization.

POSTERS

The poster is centuries old. Ancient tradesmen scratched, drew, or painted signs alongside the doors of their shops to attract customers, and medieval merchants displayed pictures of their merchandise for the same purpose. The modern illuminated pictorial store sign—boot, watch, diamond, hat, beer mug, fish, and so on—is in reality only a later development of this poster idea. Posters, literally hundreds of thousands of them, have a very important place in our present-day civilization.

The usual form of this type of visual aid varies all the way from a simple printed card to a complicated and highly artistic picture. It is designed (1) to make an instant appeal; (2) convey and drive home a single main idea or at most a very few ideas; and (3) usually to be seen and understood at a distance. Common examples are the billboard or glorified poster, cafeteria menu, magazine cover, book jacket, postage stamp, and car and show-window cards. Although the poster may represent almost any type of material from the concrete to the abstract, like the cartoon it must be clear enough to be understood at a glance. Nearly always some text reflecting humor, pathos, ridicule, and so on, is included in graphic posters, but this is kept short and simple in order that it may be quickly and easily read and interpreted. Often the poster includes maps, charts, graphs, diagrams, photographs, and other types of pictorial representation.

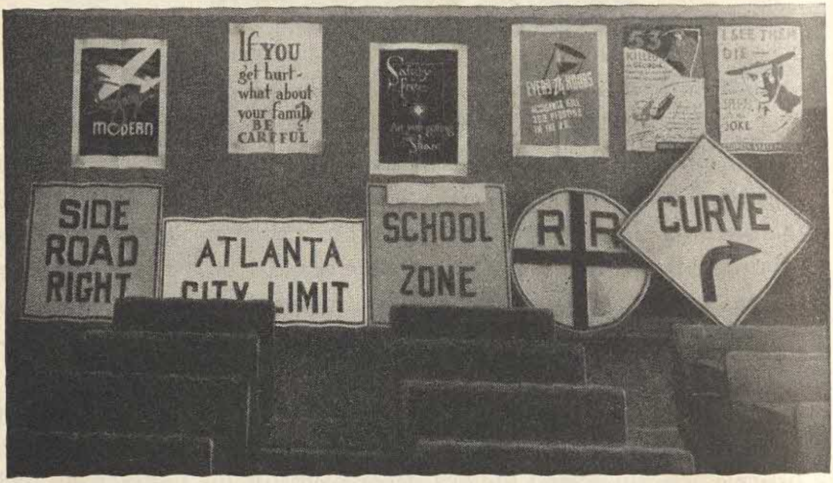


FIG. 4. Posters and road signs are used effectively in teaching safety. (*Courtesy of National Safety Council.*)

Posters for school use may be obtained from a variety of sources such as travel companies, industrial and commercial concerns, libraries, museums, printing and supply houses, chambers of commerce, fairs and exhibitions, theaters, and government offices, or they may be made by the pupils themselves. Even though the artistic requirements of a good poster are high, the materials are easily available and inexpensive; the illustrations—drawn, painted, photographed, cut (silhouettes), or clipped—and the text—drawn, painted, or made of large letters clipped from newspaper headlines and magazine titles or obtained from print shops or supply houses—may be very easily and attractively composed on construction paper or illustration board. Often actual specimens such as cotton, wool, fabrics, leaves, twigs, minerals, heads or stalks of grain, can be used to good advantage.

These aids are not only effectively used in advertising, promoting such school activities as thrift, safety, courtesy, and other drives and campaigns, and athletic, music, and dramatic events, but also in connection with the teaching of arithmetic, reading, spelling, geography, music, history, science, and all other subjects in the curriculum. Often it is desirable and necessary to utilize pictures, slides, maps, charts, and other types of aid, as well as verbal instruction, to provide additional details and information. An attractively designed, executed, and displayed poster that can be looked at again and again can have a cumulative educational effect. A series of progressively constructive posters can be very effective in developing an idea, principle, or concept.

CARTOONS

The cartoon, probably the most widely read item in the newspaper, is similar to the poster in that it makes an instant appeal and conveys a single main idea but differs in that it is usually not so large and, more important, in that it treats a topic less seriously. It utilizes various forms of vigorously presented, dramatized, and personalized humor, satire, absurdity, and even downright exaggeration. Because of its uniqueness and simplicity it can be effectively used in appraising, interpreting, and emphasizing. Most commonly the cartoon is used in connection with such fields as politics, history, geography, economics, and sociology, but increasingly it is being utilized in commerce, science, literature, and mathematics.[2] The cartoon is symbolic and, therefore, usually highly abstract. Consequently, in material, execution, and implication it must be simple and clear, or it will be unintelligible and, therefore, unsuccessful.

In teaching with cartoons it is essential that (1) the pupil understand the point being made—that he comprehend the symbols used and correctly interprets their implication and that (2) he himself evaluates the point of view being presented. As suggested above, a cartoon is often an inaccurately or improperly emphasized and exaggerated treatment of a point of view, a one-sided point of view, and therefore, the pupil must be taught to look at it critically. He must be led to recognize that ridicule, even though strikingly presented, is not argument.[3] A cartoon that represents a concept or idea to which the pupil does not react intellectually, that is, does not think or reason about, weigh, and evaluate, is a cartoon wasted, insofar as he is concerned.

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[2] A good treatment of the cartoon in the social studies will be found in D. C. Knowlton, "Making History Graphic," Charles Scribner's Sons, New York, 1925.

COMIC STRIPS AND BOOKS

Diagrams in action, or comic strips, came comparatively recently into the field of pictorial representation, but judging by the extent to which they are now read, they have become firmly established as important parts of newspapers and magazines, and even books. In order to catch the reader's eye they reflect many of man's interests and activities, both actual and fanciful. As might be expected, some of them are more natural, real, and wholesome than others. Although some of them are based upon humor, many of them are not "comics" at all.

Very recently there mushroomed the phenomenal development of the comic book, a hundred-million-dollar industry with an estimated annual circulation of 720,000,000 books, which are read by millions upon millions of children and adults. Because (1) these strips and books represent potential visual educational opportunities (some schools even provide them for children who have difficulties in learning to read) and because (2) of the great controversy now raging about them a brief reflection of them is pertinent. For our purposes here, the comic book, comic strip, and Sunday supplement section of comics will be used more or less synonymously.

Although our concern is with visual aids as such and not with the moral aspects or implications, in the case of the comic books the latter cannot be divorced from the former. Consequently, it is necessary to

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[3] For example, who of the present day would hold, if he gave it a single intelligent thought, that the average cartoon picture of the college professor, teacher, spinster, politician, miser, and congressman is an accurate representation of these individuals?

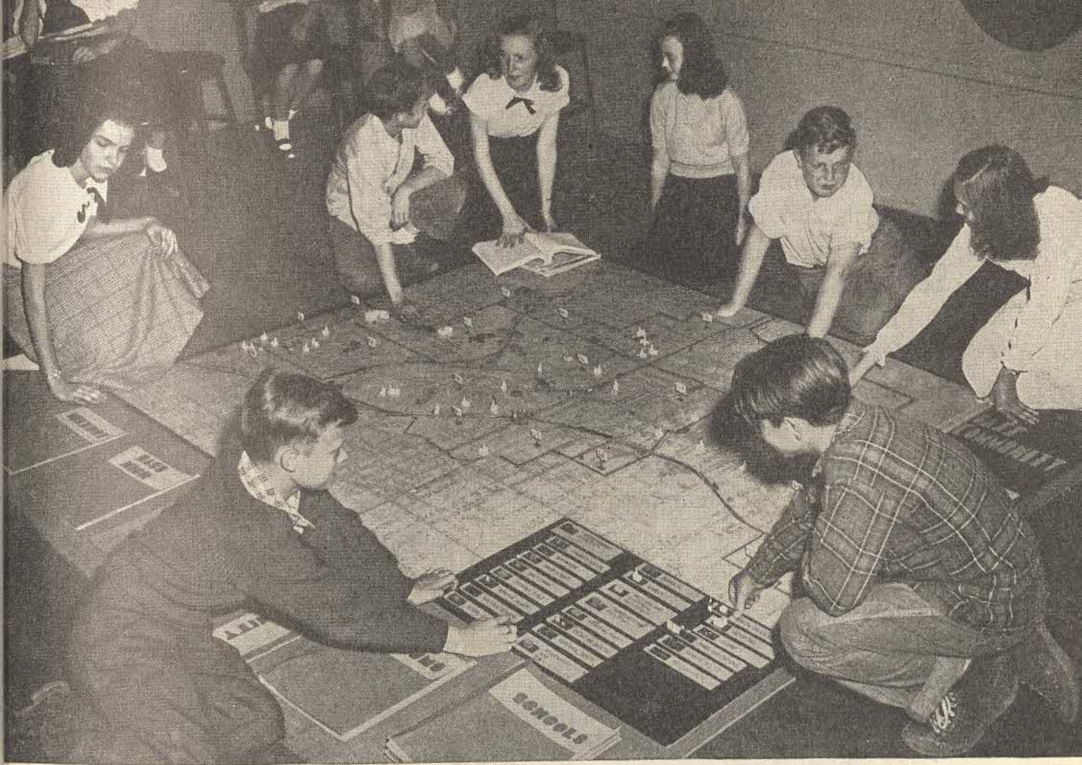

FIG. 5. These Bass High School, Atlanta, Ga., students are completing a floor map locating the important educational, recreational, health, transportation, and other public facilities and services of Bass community. The key is in the lower right-hand corner. At the rear is the bottom of an attractive correlated bulletin-board exhibit headed, INVENTIONS CAUSED IT ALL. (*Courtesy of Walter S. Bell.*)

present the case for and against these strips and books as educational agents. Hence, we will have to answer the question, "Are comic books beneficial or detrimental to young people?"

Those who approve of comic books hold that they provide harmless fun and relexation, help to break down racial and other barriers and prejudices, provide youth with vicarious happy adventure, teach children to read, and show that crime never pays. Further, say these supporters, in the case of religious, literary, and historical material they present important stories and accounts in an intriguing nonacademic manner, usually supplying many interesting details not commonly taught. These stories, say they, though fanciful, are really only a modern version of fairy tales and Mother Goose rhymes.

On the other hand, those who disapprove of them state that they are unwholesome because they reflect all kinds of sensational crime—murder, kidnapping, armed robbery, drunkenness, and torture; they glorify violence, cruelty, and depravity and make an appeal to the worst in human nature; they bombard the reader with the jargon of criminals and the horrors of degeneracy, and by the utilization of high-chested, full-hipped, and more or less undressed girls and women reflect distorted conceptions of sex.

Further, say these critics, the idea of a superman who replaces organized law and government with a lynch-law-and-mob spirit does not in any way represent a healthy and accurate view of the ideals and practices of American democracy; and the fanciful space-ship and other exploits depicted represent an undesirable "escapism" that hinders youth in his attempts to become wholesomely adjusted to reality. They also hold that comic books are the enemy of good reading because they encourage the child to by-pass the originals and thus cause him to lose the real values of the great masterpieces; and that even in "factual" representation of Bible, historical, and explorational stories, the blood, crime, and inhuman cruelty elements are greatly overemphasized. These critics also point out the harmful aesthetic effects of cheap publication—inferior printing, pulp paper, crude art, and garish cover—often with the inviting label "For Adults Only."

One of America's best known psychiatrists, Dr. Fredric Wertham, after a two-year study (with 11 other psychiatrists and social workers) of the effect of comic books on youngsters, states:

> The comic-books in intent and effect are demoralizing the morals of youth. They are sexually aggressive in an abnormal way. They make violence alluring and cruelty heroic. If those responsible refuse to clean up the comic book market—and to all appearances most of them do—the time has come to legislate the books off the newsstands and out of the candy stores. Actually, proper enforcements of the present penal laws of most states would accomplish this. . . . We found that comic-book reading was a distinct influencing factor in the case of every single delinquent or disturbed child we studied. . . . The number of good comic books is not worth discussing.[4]

An editor and publisher of comic books states, "comic books are ten times as harmful as any pornography."[5]

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[4] Judith Crist, Horror in the Nursery, *Collier's*, Mar. 27, 1948, pp. 22–23, 95–97. This article and that of Fredric Wertham (see below) should be read by every teacher and every parent.

[5] Russell Newton Roman, You Don't Think Junior Ought to Read Comic Books?, *PM* (newspaper), Aug. 16, 1945. Mr. Roman would not ban these books

Concerning the practice of some school authorities of using comic books to help teach reading, Dr. Wertham says in disgust:

> That shows how psychiatrically misguided they are—and how well the publishers are doing their work. Not only are comic books optically hard to read with their garish colors and semiprinted balloons, but they are psychologically bad, turning the child's interest from reading to picture gazing. No remedial reading clinic would resort to such a cheap, easy, and dangerous substitute for qualified and trained teachers.[6]

Writing in the same vein, Dr. Augusta Jellinek, Secretary of the New York Society for Speech and Voice Therapy and Supervisor of the Veterans' Speech Clinic at Polyclinic Hospital, says:

> The habit of looking at the very richly illustrated material makes the children reluctant to read. They develop the habit of reading only the captions and simple sentences. Since the meaning becomes clear through the picture, the child does not necessarily have to understand the exact meaning of every word. Many children prefer to read comic books to such an extent that they rarely read any other book spontaneously.

Although the emphasis in this section has been upon the comic strip, it must be remembered that similar strips of successively related cartoons or diagrams are widely and effectively used in teaching principles, processes, and practices in a number of school subjects, health, safety, home economics, agriculture, consumers' courses, shop work, athletics, and so on. Of course, these cannot be classed accurately as "comic strips" because their main emphasis is on education instead

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or forbid children to read them but rather lead the young people toward the really fine children's books that have been and are being published.

In 1948, due to the avalanche of public criticism directed at their publications, the Association of Comics Magazine Publishers pledged a self-improvement program. Fourteen of thirty-four publishing companies in the comics business agreed to confine themselves to "good wholesome entertainment or education" and outlaw (1) crimes that arouse sympathy against law and justice or inspire readers with the desire to imitate, (2) scenes of sadistic torture, (3) sexy drawings that show heroines in less than a U.S.-style bathing suit, (4) vulgar and obscene language, profuse use of slang, (5) humorous, alluring or glamorous treatment of divorce, and (6) ridicule of, or attack on, any religious or racial group.

[6] See Fredric Wertham, The Comics . . . Very Funny, *Saturday Review of Literature*, May 29, 1948. A condensation of this article will be found in *The Reader's Digest* for August, 1948. Among other things this vigorous article lists and meets the 12 arguments most commonly used to support comic books.

of on amusement. Here they do have a place and undoubtedly will make more of a place for themselves in the future.[7]

In using them, the pupil should be led to understand clearly the distinction between these two types of cartoon strip and the two types of associated attitudes in order that he does not carry over into his school work a mood, feeling, or reaction that is inconsistent with justifiable educational purposes.

THE BLACKBOARD

The blackboard came into American schools less than a hundred years ago. Its introduction was due largely to the influence of Horace Mann who had observed how it was used in European, and particularly in German, schools. Despite the fact that it is now standard equipment in all schools, it is surprising to know that very few definite attempts have been made to teach the teachers how to use it. Appropriate instruction in teachers' courses is extremely limited, and relatively few articles have been written on the subject. Little wonder that blackboard work represents one of the average teacher's greatest weaknesses. With the present emphasis on visual instruction the blackboard will doubtless receive its share of attention and thus become a more effectively used teaching device.

Uses of the blackboard. The blackboard is an indispensable part of teaching equipment. It is valuable in at least four ways: (1) because of its size and location it can be used advantageously for group instruction; (2) it provides opportunities for closely supervised, and teacher-and-pupil-evaluated, pupil activity; (3) blackboard writing and drawing intensify pupil interest and attention; and (4) it is economical because it can be erased and used repeatedly. Although changes in teaching techniques and the invention and development of duplicating machines have somewhat decreased its usefulness in individual instruction in certain types of work, it is still widely used for this purpose.

The blackboard offers many educational opportunities in all fields—curricular and extracurricular—in connection with the presenting of facts, principles, processes, and procedures; making assignments of lessons and individual responsibilities; listing questions, problems, sources, and references; giving directions, examinations, and tests; practicing individual drill or creative work; and in posting notices, announcements, and pertinent class and pupil records.

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[7] The best article the authors have read on this topic is F. R. Thomas, Animated Cartoons Join the Teaching Staff, *California Journal of Secondary Education*, vol. 19, pp. 15–23, January, 1944.

Types of blackboards. Blackboards are generally made from slate, glass, porcelain, and several types of paper and wood-composition materials. Usually they are black, although colors are now being experimented with. In any case, it is essential that the board and the crayon represent a sharp contrast in color. Movable blackboards, so constructed that they can be carried from one place to another, slid, raised, or lowered, are being increasingly used. The three latter types not only allow for the use of the space behind them but also provide for the use of the front space for projection or other purposes. Other types of blackboard—outline map, music staff, cross-section, and graph—can be used to advantage in certain kinds of work. The general trend is toward a smaller amount of blackboard space in the classroom.[8]

Blackboards are used constantly, and they, as well as the troughs and erasers, require frequent cleaning and attention. They should be kept in good repair. A broken, chipped, or cracked board represents an inefficient aid because these blemishes decrease the accuracy and readability of the material placed on it, and they also decrease the pupil's respect for it and his interest in the material represented. Exhausting attempts to comprehend material presented under handicaps, and a consequent unfavorable attitude, usually result in careless and poorly done work.

Using the blackboard. Needless to state, if the blackboard is to be used successfully in the development and checking of correct mental images, it must be used wisely and efficiently. All blackboard representations should be definitely and immediately purposeful; meaningless scrawlings or "doodlings" are confusing and distracting and are evidences of the teacher's lack of skill in blackboard work. In order to be easily readable, attractive, and respect deserving, the material should be neatly, clearly, and accurately reproduced with at least a minimal degree of artistry. Not too much material should be used at any one time because this not only clutters up the board and gives it a messy and unappealing appearance but also tends to reduce the scale used and thus makes it less intelligible. In order to show contrasts or to add to general attractiveness, colored chalk or crayon, or, for more permanent presentations, water tempera paint, should be used. Of course, the teacher or pupil demonstrator should take a position where he or she will not interfere with the pupils' clear vision of the material being presented.

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[8] One of Goins's conclusions, following his study of the use of blackboards by high-school teachers was, "The data indicated that a considerable portion of the blackboard space which has been provided for classrooms is unnecessary." The present writers believe that what he should have said, and probably what he meant to say, is, "The data indicated that a considerable portion of the blackboard space provided for classrooms is not being used." These two ideas are certainly quite different. Teachers are not taught how to use the blackboard.

Generally speaking, erasure of material not needed should be complete in order to avoid distraction; and any erasure should be made with the eraser or cloth and not with the hand or fingers.

A very common practice that should be avoided is the pasting of material over the blackboard. This practice limits the amount of space available, usually reduces aesthetic appeal, and when the material is later removed, all too often leaves paste and paper residue.

Where outlines, summaries, or similar materials are to be used by the group immediately, they should be placed on the board before the class enters or is ready to use them. If the teacher writes on the board while the pupils are waiting, she wastes their time while they wait, and in case they are supposed to copy the material, they will be handicapped by the teacher's position in front of the board. If the material is on the board when it is needed, the teacher can profitably use her time in explaining points or answering questions that may be raised. Incidentally, in this connection it is well to emphasize that the copying of long assignments, outlines, and lists of problems or questions represents a waste of the time of both teacher and pupil. These should be mimeographed and a copy given to each pupil.[9]

THE BULLETIN BOARD

Like the blackboard, the bulletin board can be effectively used in connection with just about every learning situation in the school, and if intelligently handled, it will (1) motivate, supplement, and enrich learning; (2) provide intriguing educative opportunities for pupil participation and cooperation; and (3) serve as an advertising and promotional medium for all school interests, causes, and activities.

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[9] In his investigation Fildes found that 52 per cent of the teachers in his study reported that easy access to duplicating devices had decreased their use of blackboards.

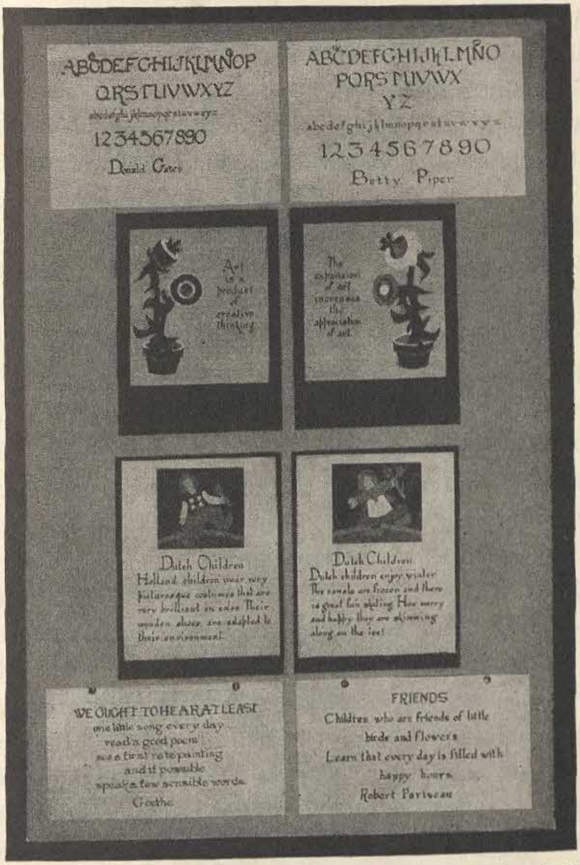
Donald Carr
Betty Piper
Art is a product of creative thinking
The expansion of art increases the appreciation of art.
Dutch Children
Holland children wear very picturesque costumes that are very brilliant in color Their wooden shoes are adapted to their environment
Dutch Children
Dutch children enjoy winter The canals are frozen and there is great fun skating How merry and happy they are skimming along on the ice!
WE OUGHT TO HEAR AT LEAST
one little song every day
read a good poem
see a first rate painting
and if possible
speak a few sensible words
Goethe
FRIENDS
Children who are friends of little
birds and flowers
Learn that every day is filled with
happy hours
Robert Pariseau

FIG. 6. No visual-aid program is complete without attractive bulletin boards.

Frankly, there is no excuse for a school not having at least one general bulletin board (many schools have several) and for a teacher not having a specialized board for the use of her own group or groups.

The types and the number of really attractive and beneficial materials that may be displayed are numerous: advertisements, announcements, reports, assignments, booklets, book jackets, bulletins, cartoons, charts, clippings, correspondence, creative projects, cutouts, diagrams, drawings, graphs, informational items, maps, news, notices, pamphlets, photographs, pictures, poems, post cards, and posters. In fact, there is little that ever has happened or that concerns man and his environment and activities that cannot be reflected on the bulletin board.

Types of bulletin board. The boards may be classified as fixed when they are more or less permanently attached to the wall;[10] movable when they can be changed from one place to another; folding when they are composed of several frames that can be swung, that is, opened and closed like the pages of a book; and wire when a horizontally placed wire is at the top of the blackboard or along the walls on which materials are suspended. The last-mentioned type is appropriate for larger and less compact items such as booklets, posters, pictures, and similar materials. When hung on a wire, prints and similar paper items should be mounted on cards to preserve their shape and also to protect them from careless handling.

School bulletin board. The school bulletin board is used largely for the promotion of events and activities of interest to the school as a whole. On it are placed advertisements of music, dramatic, and athletic events, publications, and drives and campaigns; news concerning school organizations, activities, and people; notices and announcements; rules and regulations; and material appropriate for special days and weeks. Classified exhibits of art, cartoons, poetry, nature study, science, geography, health, travel, courtesy, grooming, hobbies, and the like can be easily arranged. The bulletin board can also reflect interesting projects, activities and materials from the various classes. Interesting questions and conundrums, in which the question is asked one day and answered the next, puzzles, unusual information, and other interest-exciting devices add to the board's appeal and keep it "newsy."

Class or subject bulletin board. This type of bulletin board reflects material of specialized interest to a particular group. Here again, this device can utilize a great variety of types of material because the details of any subject relate, directly or indirectly, to all of man's activities and experiences. These displays can help to motivate, interpret, and supplement lessons, units, and subjects. Although a classroom bulletin board should not represent merely a collection of assignments and notices concerning lessons, reports, examinations, and so on, there may be a place for some of these.

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[10] Blackboards that have a narrow bulletin board across the top (often too far out of vision) and at both ends are now being made.

Maintaining the bulletin board. Although the bulletin board should be an attractive piece of school equipment, in many schools it is not. Very often it is a disgrace. Frequently it is located in an unattractive and unilluminated place, covered with a miscellaneous collection of more or less obsolete items and material carelessly designed, executed, and arranged, and fastened with an indiscriminate assortment of tacks, nails, pins, and paste. A little intelligent effort would certainly improve this device in almost any school.

Making and maintaining a bulletin board represents an excellent school, student-council, or class project. A bulletin board committee is first selected and organized. This committee makes an investigation of the possibilities—materials, number, size, frequency of posting, space available, and other details—in order to determine the size of board required. This board should be large enough to allow for growth or miscalculation but not so large that it cannot be kept fairly well filled with vital and up-to-date materials. In most cases the group will make it too small rather than too large. It may be made of cork, soft wood, Celotex, or similar material. An attractive back can be made of billiard cloth, which does not show tack holes, mounted on a soft board. A frame, appropriately and artistically decorated, may run around the edges. If desired, a hinged glass enclosure, fitted with a lock, may be made. This board should be hung in an accessible and well-illuminated place. A shaded tubular light adds to usefulness and attractiveness.

The committee studies the science of display, promotes the production of, and evaluates, selects, and posts, material.[11] It makes up a set of rules or regulations concerning the size, shape, form, content, and dating of all materials, has this neatly typed or printed, and posts it on the board. This group then keeps the board up to date by removing old material, maintaining a file, and scheduling material for future posting. It devises motivational plans whereby the pupils are spurred to "make the bulletin board"; and, from time to time, it promotes a class or school evaluation of the organization, completeness, and effectiveness of the bulletin board's display. Naturally, this committee works hand and glove with the teacher or sponsor.

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[11] See W. Emmert, Standards and Techniques for Making Posters and Booklets, *Educational Screen,* vol. 13, pp. 248–252, November, 1934.

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7

FLAT OR UNPROJECTED PICTURES

From primitive times, when he first drew pictures in the sand or scratched symbols on rocks, through the many developments and uses of papyrus, paper, canvas, marble, pen, ink, brush, paint, and chisel to the present, when he utilizes it in a wide variety of startling photographic representations, man has always found picturization an indispensable tool for expressing ideas or conveying information to others. Originally, our written language was pictorial, and even today some of the older systems, such as the Chinese, are based on early pictograph characters. The development of alphabetic speaking and writing may have changed the emphasis and the types, but basically it did not change the necessity or the place of pictorial representation. Man still pictures.

Try to imagine what it would be like if all pictured communication were eliminated from modern life. We should then have no illustrations, photographs, prints, or drawings of any kind in newspapers, magazines, books, catalogues, and travel folders; no billboards, post cards, or motion pictures. We could not draw a simple map to show the location of a store or depot. The very fact that these picturizations are used widely is evidence that industrial, commercial, and professional interests, which spend vast sums of money in preparing and distributing them, accept them as important educational devices. What confusion would result if these pictorial representations were eliminated from our formal educational materials and procedures. Here, also, they have been widely accepted as significant instructional instruments, not only as aids but also as important sources of information.[1]

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[1] A good and recent discussion of the place of art in an educational plan and the modern methods of teaching it will be found in "The Visual Arts in General Education," Appleton-Century-Crofts, Inc., 1940. This book is the report of the Committee on the Function of Art in General Education for the Commission on Secondary School Curriculum of the Progressive Education Association.

Definition. The "still" picture has been attractively defined by Emmert in these words: "The still photograph represents a cross section of a visual experience at the instant it occurs. It stops motion, shows line and color, indicates spatial relationships, and portrays people, objects, and scenes in which motion is not an essential feature."[2] Commonly used types of the still picture are the so-called "flat" or unprojected pictures—photographs, prints, paintings, and stereographs—and projected pictures—opaque projections, slides, and filmstrips. The former will be discussed in this, and the latter in the next, chapter.[3]

Values of flat pictures. Because the values of the still picture are well known, there is no need to do more than merely mention its place and advantages in instructional activity. As in the case of objects, specimens, and models, pictures provide opportunities for the obtaining of the basic visual imagery essential to thinking and living. They represent the raw material through which the pupil becomes acquainted with the elements of his environment, both immediate and remote. They help to provide in a vicarious way concrete experience with the individuals, events, activities, and things of the local community as well as those of other peoples, other sections of the world, and other times.

Generally speaking, direct experience with the real object or process is preferable to a pictured reflection or substitute for it, but such direct experience is not always possible. Verbal descriptions only would often be cumbersome and in some instances entirely inadequate, perhaps even impossible. However, through picturization the individual can see very clearly and accurately, and he can see instantly. Further, a picture can be filed away in the mind for later use much more easily, successfully, and permanently than a mere verbal description. In short, pictures, like words, represent an important means of communicating ideas.

The still picture, one of the most universally used aids in education, is popular because (1) it is real and vivid and brings clarity, enriched meaning, and emotional response; (2) it provides motivation because of its immediate appeal; (3) it is easily available; (4) it is convenient to use; (5) it is inexpensive; and (6) it can be used repeatedly. This last value is very important when one realizes that a picture is not something to be merely looked at and then passed by but something to be analyzed, studied, thought about, and correlated.

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[2] W. Emmert, Standards for Selecting and Evaluating Still Pictures, *Educational Screen*, vol. 16, pp. 317–318, December, 1937.

[3] Some teachers and writers classify maps, cartoons, posters, charts, and similar materials as flat pictures. The authors prefer to designate them as graphic materials and, therefore, discuss them separately (see Chap. 6).

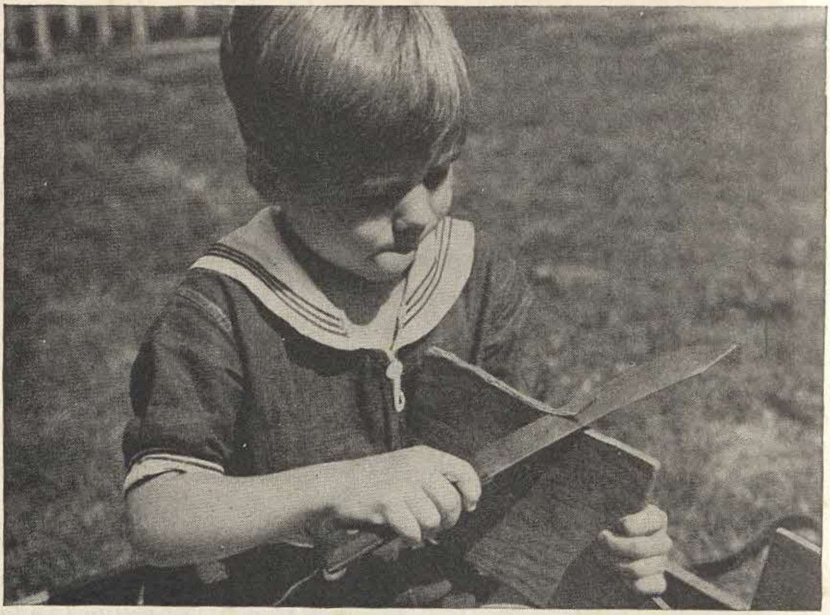

FIG. 1. Nearly every boy and girl would instantly understand the lesson this picture teaches.

Various types of combinations of still pictures taken of different elements of the same item can very realistically portray contrasts and comparisons; and taken at different intervals they can show continuity or the various stages in the development of the item—the construction of a house or an automobile or the growth of a plant or flower; or they may show all three—contrast, comparison, and continuity—in one subject such as the development of illumination or transportation.

TYPES OF FLAT PICTURE

Flat or unprojected pictures are of various types such as (1) photographs, prints, paintings, or sketches, which the pupils may handle;

(2) wall and bulletin-board pictures; (3) murals, frescoes, and billboard illustrations; and (4) textbook illustrations. These, with the exception of the third group which may be "borrowed" by pupil visits to the exhibits, may be purchased, rented, borrowed, or prepared by the teacher and the pupils.

Purchased, rented, and borrowed pictures. These pictures, which are available through a number of commercial and service companies, museums and libraries, and private individuals, usually represent careful selecton and high-class workmanship.[4] The school can buy, rent, or borrow not only individual representations or reproductions but also articulated sets of from 15 to 25 or 30 pictures, and even coordinated series of these sets. Frequently, these sets contain teaching and using suggestions and sometimes even more extensive textual explanation and supplementation. Protective jackets and envelopes and often filing or indexing cards are supplied.

Perhaps there are only two disadvantages to the utilization of purchased, rented, or borrowed pictures. First, they do cost something, even though relatively inexpensive when bought or rented. Second, when pictures are rented or borrowed, the pupils do not take an active part in choosing, preparing, and mounting them, and lose some valuable training, as well as the emotional thrill, that comes through such participation. In general, however, a school can well afford to provide purchased, as well as encourage the development of teacher-and-pupil-prepared, pictorial materials.

Locally prepared pictures. Although the teacher and her pupils cannot hope to rival expert professionals in taking, selecting, and preparing pictures for classroom use, still they can learn to do these quite satisfactorily. As implied above, these activities, wisely planned and carefully supervised, can have educative value. Often the group can make a closer and better application of materials to its work by preparing instead of purchasing or renting materials. The emotional attitudes taken by the pupils because of their participation in a project may be valuable outcomes, but it should be remembered that time and efforts can be, and probably often are, wasted in preparing this type of material.

Sources of pictures. There are many sources from which pictures may be obtained easily and inexpensively. Some of these are newspapers, especially Sunday supplements and magazine supplements; magazines (both new and secondhand), such as *National Geographic*, *Asia*, *Mentor*, *Travel*, *Nature*, *Pictorial Review*, *Ladies' Home Journal*, *Life*, *Look*, and *Pic*, as well as specialized professional journals;[5] commercial and industrial houses; chambers of commerce; transportation companies and services; state and Federal departments, bureaus, and offices; libraries and museums; local amateur and professional photographers; and pupils and teachers of other schools in this and foreign countries.[6] The pupils themselves may take quite appropriate pictures. Most of this material is easily prepared for class use. Discrimination must be exercised in the selection and use of advertisements,[7] some of which may represent undesirable products as well as misemphases and inaccuracies; but even a consideration of these will mean an educational opportunity for the pupils.

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[4] See pp. 585–586 for a list of these sources.

Making pictures. Although the simplest form of picture is a drawn one, because of the incompetency of the pupils, it is hardly possible to produce it in quantity in the average classroom. However, it is possible to make accurate silhouettes—to draw lines around and fill in the shaded areas of projected figures. All that is needed is paper, a pencil or pen, an object, and light. In an extension of this process—photogramming—an object is placed on a sensitized surface, such as blueprint or photographic paper, film, or plate, an exposure is made, and the picture is then developed. A little experimentation with this inexpensive process will produce rather amazing results.[8]

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[5] An excellent article is J. P. Givler, An Undeveloped Mine of Materials for Visual Education, *Educational Screen*, vol. 19, pp. 53–55, February, 1940.

[6] National and international exchanges of school correspondence are a part of the American Junior Red Cross program. This correspondence is prepared in the form of albums containing friendly letters describing the school and its activities, the community, and related subjects of mutual interest. The letters are illustrated with drawings, water colors, pen-and-ink sketches, and other examples of original schoolwork as well as with post cards and photographs. These albums are exchanged through Red Cross channels. Both elementary and secondary schools may participate. Information may be obtained from the local Red Cross chapter or from National Headquarters, American Junior Red Cross, Washington, D.C.

The International Students Society, Hillsboro, Ore., is a somewhat similar organization, which arranges correspondence between school children and college students in the United States and 50 countries around the world.

The Club Exchange Department of *The Instructor*, F. A. Owen Publishing Company, Dansville, N.Y., is also an excellent source for the names and addresses of individuals and groups wishing to exchange letters, souvenirs, pictures, products, magazines, books, and other objects.

The National Bureau of Educational Correspondence, George Peabody College for Teachers, Nashville, Tenn., promotes correspondence in France and Latin America. The Student Forum on International Relations is another of this organization's interests.

[7] An article showing how advertisements were used in one subject and which is suggestive of how they may be utilized in connection with other fields is R. B. Colvin, Advertisements as Teaching Aids in General Science, *School Science and Mathematics*, vol. 34, pp. 79–83, January, 1934.

More than ever before pupils are taking pictures, using equipment varying from the simplest bought or made pinhole camera to the more expensive camera. Pupil and teacher enthusiasts are found in nearly all schools and camera clubs in many of them. Certainly, a setting in which the pupil photographer searches for, and decides upon, his subject, studies the relative importance of its elements, and then photographs it to bring out what he wants to emphasize promotes discriminating observation. Here again, photography in its professionalized aspects is a highly developed and technical field, and the pupil need not be expected to rival the expert. However, he can contribute much to the program, especially material that is particularly appropriate because it is of local interest and significance. Too, he can take pictures of subjects in other parts of the country while on a trip or tour, as well as pictures which, owing to climatic or other conditions, are not available during the regular school year.[9]

Mounting pictures. Pictorial materials should be mounted in order (1) to enhance their attractiveness; (2) to make them more usable; (3) to preserve them; and (4) to make them more accessible. A copy of a good picture magazine is available to but one pupil at a time, but if its pictures are clipped and mounted, they may become available to several pupils at the same time. A well-mounted picture, print, or clipping is more important appearing than an unmounted one, and it is also more artistic because of the contrast between, or the blend of, it and its mount. It is more easily passed around, handled, and used; it can be laid down perfectly flat, stood upright, or hung up. It is more easily preserved from wrinkling, bending, tearing, or soiling, and too, it can be more conveniently filed than an unmounted item. Further, it is possible to mount several items showing comparison, contrast, or continuity close together in order that the lesson they portray is all the more clear. Needless to state, any mounting must be carefully done in order to achieve these values. A poorly mounted print—one inaccurately cut, inartistically located, carelessly glued, or amateurishly labeled—represents a waste.[10]

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[8] An interesting description of A Living Picture Book, from which the characters step out and speak, will be found in A. M. Gasslander's article under this title in *Educational Screen*, vol. 16, pp. 128, 130, April, 1937.

[9] See pp. 254–257.

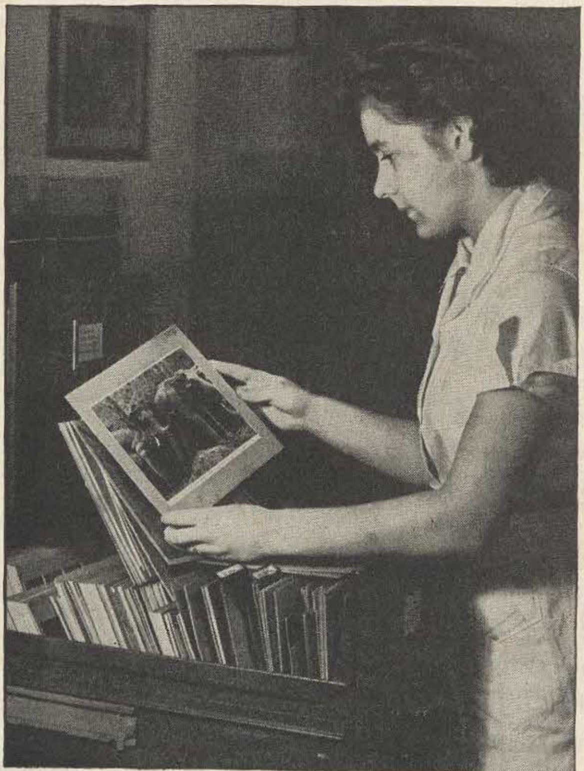

FIG. 2. Mounting pictures and keeping them in a catalogued file protects them and ensures that they are readily accessible. (*Educational Screen.*)

In an earlier day pictures were mounted in a stereotyped fashion with uniform margins and mounts limited to four or five colors. Now there is much more freedom in these matters. Items should be mounted on a substantial back, such as construction or corrugated paper, strawboard, Bristol board, chip board, illustration board, matboard, wood veneer, or metal—all of which may be purchased from almost any supply store. The mount should be durable, rough rather than smooth in order not to show fingerprints, and of a color that harmonizes with the print or emphasizes it. These mounts can be cut more accurately with a paper cutter than with scissors. Usually the storekeeper will cut them at a little additional expense. Such mounts are relatively inexpensive and are worth all they cost.

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[10] More detailed directions than those suggested here for preparing and mounting materials may be obtained from any standard book on art instruction.

The picture itself should be neatly and accurately trimmed. The margins, which are desirable in order to prevent the print from becoming soiled and which may vary with the size and number of pictures being used, should be measured carefully and the boundary points indicated by a very light pinprick or pencil mark. The item may be fastened on with paste, liquid glue, rubber cement, or dry mounting tissue that melts when heat and pressure are applied. For temporary mounting spot pasting is satisfactory, but for permanent materials rubber cement, which may be bought at any automobile supply store or tire shop, is probably the best because it does not curl or warp the picture, it does not require a hurried application, and the excess can be wiped off with a moist cloth without leaving a stain. In fact, within certain limits, the drier the cement is, the better it sticks. Both the picture and the mount are coated, allowed to dry, and then stuck together. The print may be smoothed out with a clean rolling pin. If rubber cement is not used, the picture and its mount should be flattened under a weight while drying. A neatly drawn line near the edge of the margin gives the product a finished and artistic appearance. All materials should be carefully and plainly labeled either on the front or on the back, depending on the space available and the length of the legend.

More fragile items, such as old letters, pictures, or documents, should be covered with glass or other transparent material. They may be put in a frame, case, celluloid jacket or envelope, or on the table under a piece of plate glass. Cellophane is satisfactory for this purpose if it is handled carefully to prevent bending or wrinkling. In fact, many teachers cover all pictorial material with cellophane, cementing it at the back of the mounting. Fingerprints, smudges, and dust are easily removed from this cover by rubbing it with a wet cloth.

TEXTBOOK ILLUSTRATIONS

For many years pictorial illustrations have been used not only in connection with verbal instruction but also in written educational materials. The famous "Orbis Pictus" of Comenius and our own "New England Primer" are well-known examples of early attempts to vitalize textual materials with picturization. Comparatively recently there have appeared two very clearly defined trends in textbook production that may be appropriately mentioned in this connection because the flat picture idea and practice are closely bound up with both of them.[11]

The first trend is in the direction of more purposeful illustrating. Up until the last few years textbook illustrations, more or less carelessly collected or designed, were thrown into books in order to decorate or embellish them. Pages of solid text are usually somewhat discouraging to the pupil because they lack variety; they provide but few rest periods, and even these are limited in extent. In order to make books appear more attractive, illustrations were introduced, not for their value in aiding the pupil to understand the textual material more readily, but largely in order to make the page appear less discouraging. Probably all publishers of an earlier day would have been quick to deny this indictment and perhaps, too, they might have been able to point out examples of instances in which the illustrations were really helpful. But in general there was no established policy of illustrating for meaning's sake. This was more characteristic of sketches and photographic reproductions than of figures and maps. Probably, in the last analysis, the teachers instead of the publishers were to blame. If teachers had used illustrations and, consequently, demanded useful ones, these undoubtedly would have been provided.

Today textbook illustrating represents a large area in the publishing field, one in which a great deal of time, effort, and money is invested. Highly specialized and trained expert services have been developed in order to collect, prepare, place, and use pictorial representations to their best advantage. No longer are illustrations hurriedly collected, undiscriminatingly selected, and carelessly dumped in for ornamental purposes.[12] Potential illustrations and the methods of presenting them are studied and experimented with on the basis of modern physiological and psychological knowledge, and as a result our textbooks are being continuously improved. Illustrations are being used more liberally than ever before, and they are more functional because they are deliberately designed to interpret, enrich, and supplement the text. In fact, the illustrations of a good modern textbook are integral parts of it. In a similar manner the descriptive legend, which replaced the earlier one-word or few-word label, is also being continuously studied and improved. Textbook illustrations, like any other pictorial representations, should be studied, correlated, and applied by the teacher and her class, but, sad to relate, often this is not done.

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[11] See also the reference to Encyclopaedia Britannica Films's plan of providing correlated films with textbooks and courses, p. 230. "Sportsmanlike Driving" is an excellent example of modern textbook illustrating. Its 455 text pages include 286 highly instructional illustrations. It is published by The American Automobile Association, Pennsylvania Avenue at 17th Street, Washington 6, D.C.

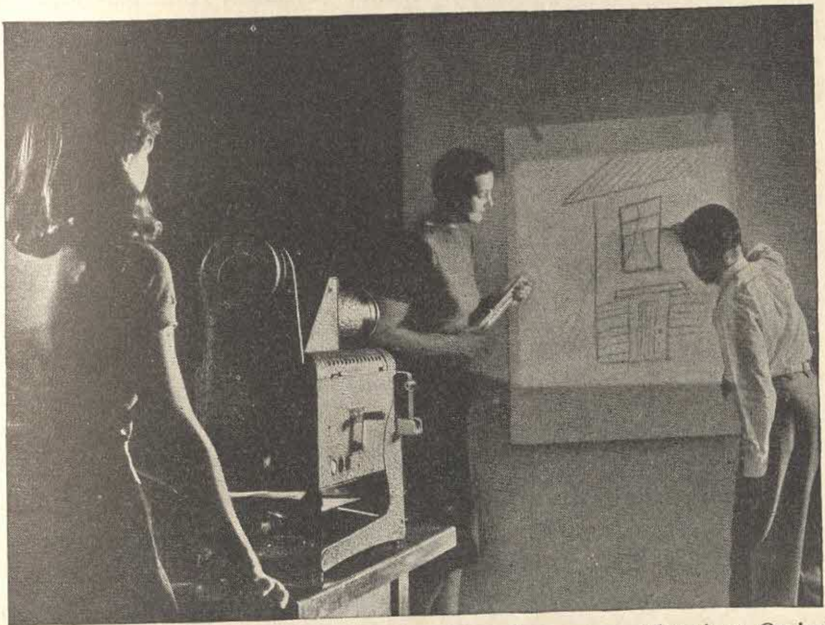

Fig. 3. Making a flat picture from a projected picture. (*American Optical Company.*)

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[12] Incidentally, the 148 illustrations of this book were selected from more than 400 that were seriously considered.

The second trend in textbook illustration development is, in one way, only an extension of the first, but basically it is quite different. In the first trend the text is still the starting point, and the illustration supplies the enrichment; in the second, the illustration is the starting point, and the text amplifies it. In this case the text is largely a glorified descriptive or explanatory legend. Probably this technique is psychologically sound too, at least this is the order of actual learning—first a percept or visual experience and then a concept or mental image. Examples of this type of presentation are the books widely used in the training provided by large industrial concerns, the armed forces, in the hundreds of children's picture books that are to be found in any bookstore, and the textbooks that are being increasingly used in the primary grades of the schools.

An excellent illustration of this method of presentation is the "Picture Fact Books" prepared by Picture Fact Associates.[13] Illustrative of these very attractive books, designed for vocational-guidance purposes, are "Air Workers," "Movie Workers," "News Workers," "Nurses at Work," and "Textile Workers." These books run about fifty or sixty pages and are a little larger in dimensions than the usual school textbook. Each contains various types of illustrative charts and graphs as well as large and small photographs. Fourteen titles are now available.

"Compton's Pictured Encyclopedia"[14] is a 15-volume work, which is built around thousands of intriguing photographs, maps, drawings, and so on. A great many of these illustrations are in color. Interest-arousing legends and clearly written text add to general attractiveness. In addition to their individual-use possibilities, these illustrations can be utilized for group consideration by means of the opaque projector. A Fact Index, which covers all related materials in the set, includes references to all illustrations, adds supplementary thumbnail articles, and helps to make the material easily accessible.

These books are, of course, intriguing. Their appeal is the starting point of any deep-seated interest. The present trend toward more purposeful illustrations presages a most profound and beneficial change in American textbook production.

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[13] Published by Hinds, Hayden & Eldredge, Inc., 1939–1942.

[14] F. E. Compton & Company, Chicago, 1949. (Revised annually.)

SELECTING PICTURES

If pictures are to be used most effectively, they must be selected most carefully. A miscellaneous collection of odds and ends does not represent a good and useful file of material. The following questions will suggest some of the more important technical and instructional standards or criteria on the basis of which a picture should be judged.[15]

1. Is it purposeful? Relevant? Significant? Does it show clearly the points desired? Will it really aid? Specifically, just how?
2. Is it truthful? Authentic? Up to date? Complete?
3. Is it easily understood? Simple in composition? Proper in emphasis?
4. Is it stimulative? Interesting? Will the pupils study it seriously?
5. Is it suggestive of reality? Action? Contrast? Comparison? Continuity?
6. Is it appropriate to the age and grade levels of the pupils?
7. Is it artistic in elements, composition, lines, color, and finish?
8. Is it a good print, clear and distinct? Free from blemishes or soiling?
9. Is it of practical size? Large enough to show details and small enough to be easily handled and used?

PRESERVING AND FILING MATERIALS

In order to preserve pictorial materials and also to ensure that they are easily available when wanted, some sort of filing system is necessary. In the classroom or small school this need not be elaborate, but it should be practical and well arranged. Usually, for mounted prints an upright filing cabinet of cap or legal size, which may be bought new or secondhand, or made, is quite satisfactory. Shelves and boxes may be used for more cumbersome types of material. A conveniently located worktable will be found of great value in the handling and filing of mounted materials.

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[15] Probably the most thoroughgoing scientific study of standards for pictures is Lelia Trolinger's dissertation, "Evaluation of Still Pictures for Instructional Use," published by Educational Screen, Inc., Chicago, 1939. A condensation of it will be found in *Educational Screen* for March, April, and May, 1939. This investigation included the development of a score card (the various criteria of which are discussed in detail) and an experimental testing of the value of it. A good review of the pertinent literature is also included. This study can be read with profit by any teacher interested in visual aids.

All material should be classified and catalogued or indexed in order to make it easily accessible. Every picture should be named. Where several pictures are usually used together, it may be advisable to file these as a set in an envelope, folder, or other jacket. In such cases it is a good idea not to include more than twenty or so in each set. A cataloguing system is composed of two main parts, a numbered or lettered descriptive statement on a card or list that corresponds to the number or letter of the item in the file. Both major and minor classifications are desirable. The Dewey decimal system is quite useful for the larger and more complete files. If several teachers or groups use the material, a cross-indexing system, which lists individual items as well as complete sets under several heads, will be necessary.

Transparencies, slides, and still film are usually somewhat fragile and easily damaged and should be suitably protected against scratching, breakage, soiling, or other injury. They may be wrapped up, framed, or placed in suitable jackets or envelopes, labeled, and then properly filed in a box or other container.[16]

Scrapbook or album filing is an economical method of preserving materials, although it may not always be so convenient for classroom purposes or allow for replacements so easily as folder filing. The books may be either made or purchased. Sometimes it is possible to obtain from a local clothier or tailor sample catalogues that may be used advantageously. These can be adapted by tearing out the samples and covering the advertising matter, or even the entire page, with art paper. An album may be made for a particular subject or even for particular units of a subject. Often these albums may be made the basis of a display or an exhibit. Also, pupils may be encouraged to produce their own picture books, being motivated by a contest or an exhibit. Album making offers a very real opportunity for a practical training in art. It must be remembered, however, that the main purpose of the scrapbook is to teach the subject being studied.

The file must be continuously maintained because of the possibility and probability that, unless very closely supervised, material will become misplaced or lost. And also, the file must be continuously improved because the material must be kept up to date. Newer and better illustrations will frequently be found, and these should be added or used to replace inferior items. Therefore, provision should be made for future development of the file.

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[16] See pp. 183–185 for a more detailed discussion of filing this type of material.

TEACHING WITH FLAT PICTURES

Selecting a good picture and preparing it for classwork are useless gestures unless the picture is utilized effectively. It can never be utilized effectively until the teacher knows its elements, recognizes and appreciates its potentialities and applications, and plans and acts accordingly. Merely allowing the pupils to look at pictures rarely, if ever, represents effective utilization. They must be led to look for and to see things and relationships. They must see actively, thoughtfully, critically, and with personal satisfaction.[17]

Even at best a picture is not only a complicated thing but also only a partial substitute for reality. Its representations can never be considered completely self-explanatory or its lessons completely self-evident. Although some of the ideas reflected may be clear, certainly some of them, such as distance, speed, action, height, weight, breadth, temperature, sound, taste, odor, tactility, and color, are at least somewhat abstract, and often very considerably so. A picture leaves much to the imagination. In short, it must be very definitely and intelligently *taught* if it is to be correctly interpreted, understood, and correlated by the pupil.

The understanding of an abstraction depends on previous experience by which or through which an item is interpreted. If the pupil does not have this experience, his conceptions are quite likely to be erroneous. Naturally, then, a picture is abstract in those elements with which the pupil is not familiar. The pupil who has listened to the roar of an aviation motor, felt the heat of a blast furnace, or smelled the odors of a gas plant can easily read these experiences into the appropriate elements in pictures and get a full meaning from them. The pupil who has never had these experiences visualizes incompletely.

Often the picture itself contains hints that help the pupil to interpret it properly or help to make it real. The heavy furry clothing worn by the Eskimo clearly suggests a low temperature, while the scanty clothing worn by a Fiji Islander suggests high temperature; the foamy wake behind a speedboat indicates both direction and speed; and the picture of a man alongside an animal or a building indicates size. A good legend provides descriptive or explanatory notes that help the pupil to translate vague abstractions into vivid realities. Teaching the pupil to look for these comparative and explanatory items is one method of relating experience and thus reducing the number and the degree of abstractions. Making comparisons and explanations with pupil-experienced items outside of the picture is another method of bringing increased meaning.

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[17] Reading Pictures: Report of a Unit, by John C. Raymond and Alexander Frazier, *English Journal,* October, 1948, is a description of a 12-week unit of study in a journalism class at Phoenix high school. The unit was built around news pictures, cartoons, and filmstrips.

Sometimes pictures without legends or captions can be used to good advantage by the teacher. For instance, such pictures may be used to stimulate the pupils to think about a new unit or topic. They can be used in a number of identification games, review stunts, competitions, and tests. Displaying uncaptioned pictures and having the pupils suggest appropriate titles, captions, or legends represent a good method of teaching the pupils to look at pictures intelligently. In such instances the pupils must actually look for something; they must see all of a picture's various elements and evaluate these in terms of relative importance or relationship. What else is "looking at pictures intelligently"? A comparison of the pupils' captions with the "official" legend (written on the back of the picture or on a corresponding card) will serve as an immediate and, therefore, functional checkup or test.

All too frequently a teacher attempts to use a picture too hurriedly, jumping right into it and expecting the pupils to follow. In so doing, she evidences an ignorance of what actually takes place when a person looks at a picture. The person who looks at a new picture looks at it at least twice or in two different ways.

In the first place, he glances over all of it in order to get a more or less superficial overview or general survey. In doing this, he learns its general theme and, consequently, what it is about—horses, war, sports, buildings, nature, or other topic. This overview gives him the setting and the proper mind-set, which will help him to interpret many of the other elements of the picture which he could not do so easily if he saw only a small portion of it. It would be possible, for instance, for a small portion of a picture (with the remainder of it covered) to be mistaken for a part of a horse, a building, a rock, a tree, or almost anything else.

In the second place, he looks it over again and then centers his attention on the unabstract elements, the parts or aspects that interest him because of his previous experience. It is true that occasionally the very unusual or the very beautiful or some other striking element or characteristic of the picture will catch this second look, but generally this look centers on items in which the viewer is interested, has some knowledge about, or has had some experience with.

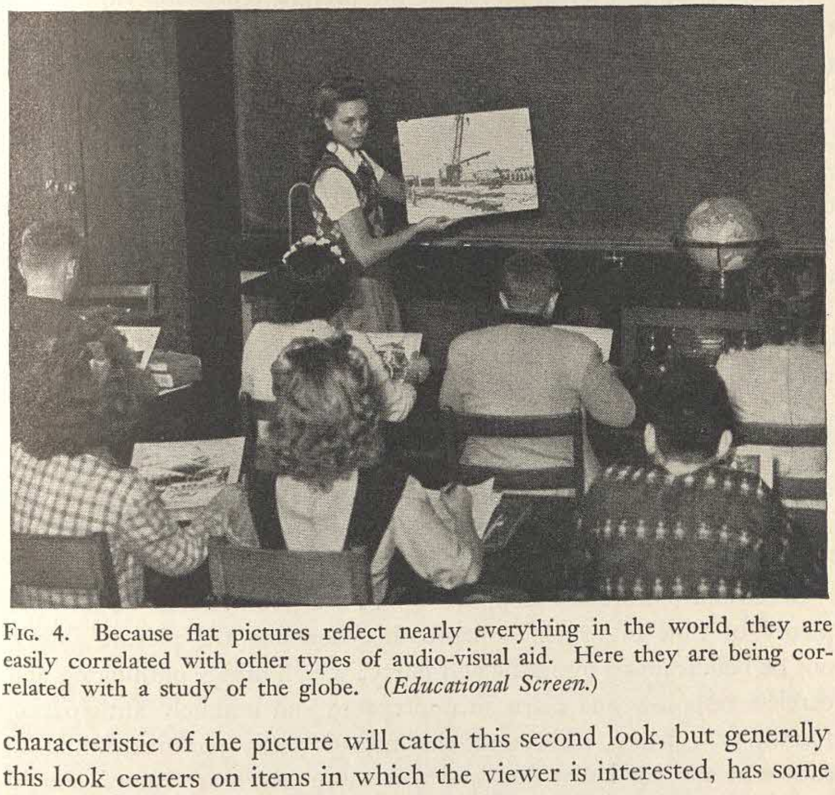

FIG. 4. Because flat pictures reflect nearly everything in the world, they are easily correlated with other types of audio-visual aid. Here they are being correlated with a study of the globe. (*Educational Screen.*)

It is not only entirely possible but often quite probable that the items the pupil sees in his second and later looks do not represent the items that the teacher wants him to see or at least wants him to see most—the things that represent her purpose in showing the picture. But she must allow ample time (especially in the typical class in which some pupils will look more slowly and see less than others) for these first two looks because he is going to take them whether she has other plans or not, and if he takes them first, she will be less handicapped by conflicting interests when she points out her items. Further, such looks intrigue the pupil because they represent actual participation and self-activity. When the pupil's initial curiosity has been satisfied, at least partially, it will be comparatively easy for the teacher to indicate, either directly through pointing out or indirectly through questioning, the elements or relationships that she has in mind. Usually, what the pupil has already seen in the picture represents experience that will help him to interpret more readily and easily what the teacher points out or emphasizes.[18]

Teaching with pictures will be successful only if the pupil has a good opportunity to study them at close range, and generally this means a supply large enough for every pupil to have an individual copy. Occasionally, it may be necessary and even desirable for a small group of two or three pupils to use a single picture at the same time, but generally speaking, such study is likely to be quite distracting, especially for the more timid pupils and those whose eyesight is weak. If a set of different pictures is being used, a picture route may be arranged in the class, thus allowing each pupil to see all of the prints. At a given signal the prints are passed along to the next viewer. If the pictures are hung around the room, the pupils and not the prints change places. If at all necessary and possible, the teacher should arrange these prints in order that the pupil sees them in some logical or progressive order.

Because a picture is a complex thing, the pupil should be allowed plenty of time in which to master it. Learning the picture should not be handicapped by hustle and hurry, which brings unthinking and careless responses and often an unprepared and untimely anticipation for the next print. This means that not too many pictures should be shown at any particular time and that those which are shown should be closely related to the subject under discussion because unrelated pictures serve only to distract attention. The most common weakness in the work of teachers untrained or inexperienced in visual instruction is that they attempt to show and teach too much. The test of good picture teaching is not to be found in the number of prints displayed but in the extent that those which are shown are relevant and really learned. Studying a few carefully selected pertinent pictures is much more profitable than merely looking at a greater number.

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[18] Two good references by G. T. Buswell on this topic are "How People Look at Pictures," University of Chicago Press, Chicago, 1935; and Learning to Look at Pictures, *Progressive Education*, vol. 14, p. 422, October, 1936.

Generally speaking, larger pictures, photomurals, photostats, or better still, projections should be used for group work.[19] More than once the writer has seen pupils squinting, shading their eyes, leaning over sideways, standing in the aisles, and half-standing in their seats in attempting to see a small picture that stood in the blackboard trough or on the teacher's desk or that was hung at the front of the room. Such use of pictorial materials is inexcusable. Incidentally, pictures hung about the room should be hung attractively, that is, low enough for the pupils to see them without standing on their tiptoes or stooping, far enough apart to eliminate crowding, and away from the bulletin board and other similar more or less untidy material. Too, they should usually be framed. Many schools use frames with removable backs in order that the pictures may be easily replaced with new ones. As nearly always pupils will want to handle the pictures, some kind of appropriate provision for this should be made.

Just where in a unit or lesson should pictures be used? Obviously, where they best fit, that is, where they will bring new interest or meaning more clearly and effectively than teacher or pupil discussion or the utilization of other aids. In any other setting they are a waste of time and attention. These representations may fit in anywhere—in introducing a subject, in supplementing class discussion, or in recapitulating a topic. To emphasize this point they should be capitalized where they promise the greatest contribution to learning.

Other commonly approved and used teaching techniques, such as making a good assignment, giving definite directions, asking pointed and useful questions, making clear and practical applications, illustrating or supplementing with other aids, and stimulating, respecting, and fairly evaluating pupil answers, questions, comments, and discussion, and testing are as logical and helpful in teaching with pictures as they are in teaching with any other instructional devices and materials.

THE STEREOGRAPH

The stereograph (perfected by Oliver Wendell Holmes), unlike the motion-picture film or the glass slide, was not used first by the indus-

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[19] Informative Classroom Pictures has made all of its flat pictures available in filmstrip form.

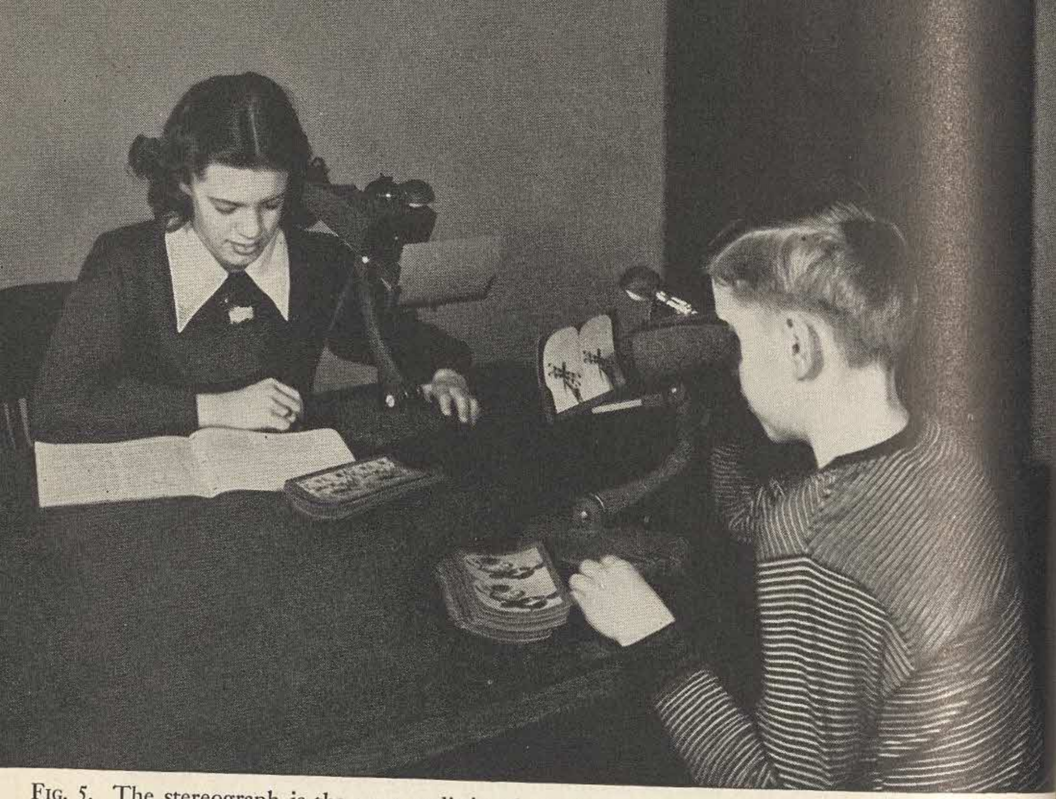

FIG. 5. The stereograph is the most realistic of all pictures because of the illusion of depth. Here two pupils are using the new Keystone Televiewer. (*Keystone View Company.*)

trialists or by college professors and then brought into the elementary and high schools; it was first used in the home, where it was introduced about the middle of the nineteenth century. Although all of us have probably marveled at the extremely realistic view that it presents, it is interesting to note that it has not been used so extensively in the schools as some of the other visual aids. Probably the main reason why it is not used more widely is that few teachers know how to capitalize on it as a teaching aid. However, as teachers become better acquainted with its value and the methods of using it, this device will probably be one of the most popular visual aids in the still-picture group.

The stereograph, the stereoscope, and the telebinocular. The stereograph is prepared by using two cameras or a camera with two lenses, which photographs an object from two different angles, these angles being approximately those at which the human eyes would be looking. The resulting pictures are mounted side by side on cardboard. When viewed without the stereoscope, the scenes look exactly alike. When placed in the stereoscope, both pictures merge into one scene, with not only height and width but depth as well. The result is an illusion of reality that is striking. The stereograph is very inexpensive. There are available thousands upon thousands of excellent pictures covering an amazing number of subjects and representing places, peoples, and activities in all parts of the world.

The stereoscope is a lightweight lens-equipped instrument in which a partition keeps the left eye on the left picture of the stereograph and the right eye on the right picture. When in position against the face the hood shuts off all light from the sides. The stereograph is placed in a frame, which is moved forward or backward to bring the view into correct focus. The viewer sits with his back to the window or light in order that the stereograph will be fully illuminated. This, of course, is not necessary when the instrument is equipped with an electric light and reflector.

The telebinocular is a binocular or field glass mounted on a table, tripod, or pedestal and generally equipped with a bulb for lighting the stereograph. Naturally, the better lenses and the brilliant light from the hooded bulb bring out the details of a picture more clearly than the stereoscope.

Advantages and limitations. The main advantage of the stereograph is that it presents a more realistic view than is presented in any other type of pictorial representation. This realism is due to the fact that the view is seen in three dimensions, whereas the photograph or print is seen only in two–it has no depth. Because of the third-dimension illusion the stereograph seemingly becomes the environment of the child. He is for the time being projected into the scene before him, the elements seemingly surrounding him. Depth is gained through perspective in the flat picture, but the size and shape of objects are not nearly so clear and distinct as they are in the stereographic view.

The chief limitation of the stereograph is that it is designed for individual instruction only; it is rarely or never used for group instruction.[20] However, this may not be a handicap but an asset because individualized instruction is an ideal of modern education. While looking through the stereoscope, the pupil is really shut off from the rest of the world, his attention is centered entirely on the scene before him, and he really becomes a part of the setting that is so vividly and realistically portrayed. His emotional reactions and his thoughts are uninfluenced by the usual atmosphere of the group recitation. The educational opportunity is his and his alone, and he cannot help but feel it.

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[20] The Keystone View Company, the outstanding producer of stereographs, discontinued recommending the using of these pictures as a class activity many years ago.

A second possibility of limitation is the fact that in some instances children with defective vision will not be able to see the third dimension; fortunately, these cases are very rare.

Teaching with the stereograph. As suggested above, the stereograph is best suited to individual instruction, and consequently, it is a good plan to have the students use it during the study period. Of course, it can be used in outside-of-class preparations. Because of the many details brought out by the third dimension, the student will find that it requires more time for mastery than a photograph or print. Hence, only a very few views should be used at any one time. Especially with new work, it will be possible to use only three to five views in the allotted time. Four or five pertinent questions on each view will help the student to study it more carefully. If several views are available for one unit of work, all may be used by the student for a rapid preview or review and in clinching particular points or emphases. Often lantern slides or filmslides on the same unit are available, and they may be used to good advantage in reviewing the unit with the class. Carefully prepared plans for the use of stereographs are at least as important as for the use of other types of flat pictures, probably more so.[21]

As is the case with all visual aids, the stereograph should be easily available to the student. Consequently, whether kept in the visual department, the library, or the classroom, the stereograph should be just as accessible to the student as any other reference material, and he should be encouraged to use it.

The standards listed in this chapter for the selection of flat pictures and the suggestions made for the storage of this material apply equally well to the selection and storage of stereographs.

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[21] An excellent discussion and a type lesson on the stereograph as an aid in teaching solid geometry will be found in C. F. Hoban, C. F. Hoban, Jr., and S. B. Zisman, "Visualizing the Curriculum," pp. 152–153.

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8

PROJECTED STILL PICTURES

Good authentic photographs pertinent to the subject have long been recognized as a most valuable instructional tool. However, until the invention of the still-picture projector[1]—opaque, lantern-slide and filmstrip projectors, or combinations of the last two—photographs could be used only by individuals or small groups. The projector made group instruction possible, thereby increasing many times the educational potential of the photograph.

During the past decade or so cameras and film have been developed and improved, and almost anyone who is interested can take good pictures. Certainly, anyone who is willing to spend time in study and practice can soon be taking photographs of excellent quality.

Color film makes it possible for one to record the subject in all its natural beauty. The addition of color not only makes the picture more pleasing and attractive but more realistic. This element of realism in the colored picture on the screen makes it one of the most valuable of teaching aids.

The ease with which subjects in the local community can be photographed and reproduced and the interest that can be developed in such a school or class activity make it possible to build an excellent library of school-produced slides reflecting local subjects.[2]

The list of slides that can be secured from commercial sources is increasing rapidly. The instructor can, by selecting from the materials produced locally or from those prepared by commercial organizations, find pictures that will contribute to almost every subject field and every grade level.

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[1] Although technically the expression "still-picture projector" is generally understood to mean the opaque projector only, it will be used here to indicate all types of machines which project still or flat pictures. This will clearly distinguish between still-picture projection and motion-picture projection.

[2] A good article outlining specific procedures for faculty cooperation in the production of pictures of the local community is C. W. Palmer, It's a "Snap" for San Jose Teachers, *Educational Screen,* vol. 27, pp. 15–16, 34, January, 1948.

TYPES OF PROJECTOR

The still-picture projector is being used much more extensively in the classrooms today than ever before. In fact, one of the greatest recent developments in the audio-visual field today is in the use of the still-projected materials. There are several reasons for this unprecedented increase:

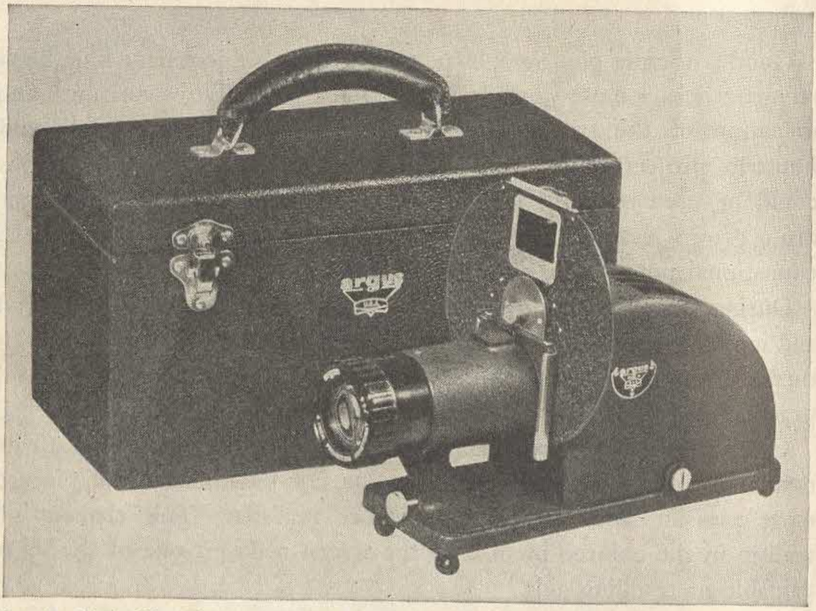

FIG. 1. Both filmstrips and 2″ x 2″ slides can be used in this compact and easily carried projector. (*Argus Corporation.*)

1. The extensive use of the filmstrip [3] in the G.I. training program proved the effectiveness of this medium as an instructional tool.

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[3] There are six possible ways of combining "film" and "strip" to represent this type of projection (and all six are to be found in pertinent literature)—film strip, film-strip, filmstrip, strip film, strip-film, and stripfilm. The authors (for the present at least) are going to side with those who use "filmstrip."

Textfilm is used to designate film which is correlated with textual materials. To some writers this term includes both filmstrips and motion pictures, while to others it means filmstrips only. A descriptive article is Eric Bender's, Textfilms, the Textbook's New Partner, *See & Hear*, vol. 4, pp. 21–23, 34, December, 1948.

2. Many companies are now producing filmstrips and 2″ x 2″ slides.

3. Some of the leading publishers are using these materials to supplement their textbooks.[4]

4. The materials for use in these machines, especially in the opaque, the 35-mm. filmstrip, and the 2″ x 2″ slide projectors, are relatively inexpensive; hence the school can afford to buy these and have them available when needed and for a long enough period of time to ensure their best utilization.

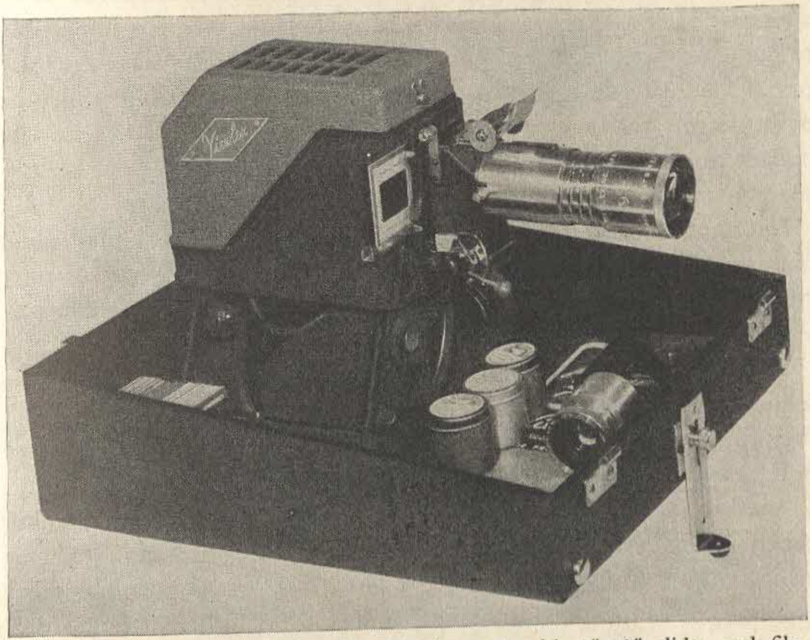

FIG. 2. This combination projector can be used with 2″ x 2″ slides and filmstrips. (*Viewlex, Inc.*)

5. These machines are simple to operate; this is a fatcor that is very important to the classroom instructor.

6. With the exception of the opaque, these projectors can be used satisfactorily in semidarkness; hence they are being used almost entirely in the classroom.

There are several kinds of still-picture projectors on the market, and each has a definite place in the well-balanced audio-visual program. Each machine has certain advantages and limitations. The limitations mentioned should not be construed as proof that one type of projector is superior to the other but rather as information to familiarize the readers with conditions and requirements necessary to obtain best results.

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[4] For accounts of this trend see footnote 3, p. 230.

In discussing the different projectors the authors are not indicating prices because (1) prices are subject to change and because (2) there are many makes, types, and models of each projector; it is impossible to quote a price range that would be meaningful. This wide range in prices should make it possible for one to select the desired projector or projectors that will meet the needs of his school and fit into the budget as well. However, before buying any machine, one should try it out under the actual conditions where it will be used.

The opaque projector. This type of projector reflects light from a picture, coin, object, specimen, or similar material by a series of mirrors through the lens onto the screen. Because the image is reflected, a well-darkened room is required for best results.

This projector is being used quite extensively in the elementary schools for two reasons: (1) elementary teachers, especially those in the primary and intermediate grades, use more flat pictures than those in the upper grades and high school; and (2) a wealth of materials can be used in it. Photographs, post cards, cartoons, comic strips, coins, paper money, maps, deeds, and a long list of similar materials can be projected for study on the screen; also tests,[5] reading and number exercises, directions, and drawings; and a host of other materials prepared by the teacher can be used very effectively. English instructors find this equipment very valuable for instruction in correcting themes. Even pictures from textbooks, magazines, encyclopedias and other sources can be projected without removing them from the source.[6] Charts, drawings, diagrams, or manuscripts prepared by the students can also be used. The fact that the student's own work is to be shown to the class is an inspiration to him to do his best.

One possible disadvantage is that the opaque projector is large and, therefore, is not as easily carried from room to room as are the other projectors discussed below.

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[5] See footnote 18, p. 190.

[6] Some magazines make available on slides their featured illustrations. For example, Kodachrome 2″ x 2″ slides of color illustrations may be obtained from Coronet Films.

When selecting an opaque projector, one should keep in mind the size of the opening under which the picture is placed. In most machines this is 6″ x 6″. However, in some the opening is large enough to take a full page, 8½″ x 11″. The larger opening makes possible the use of a much wider range of material.

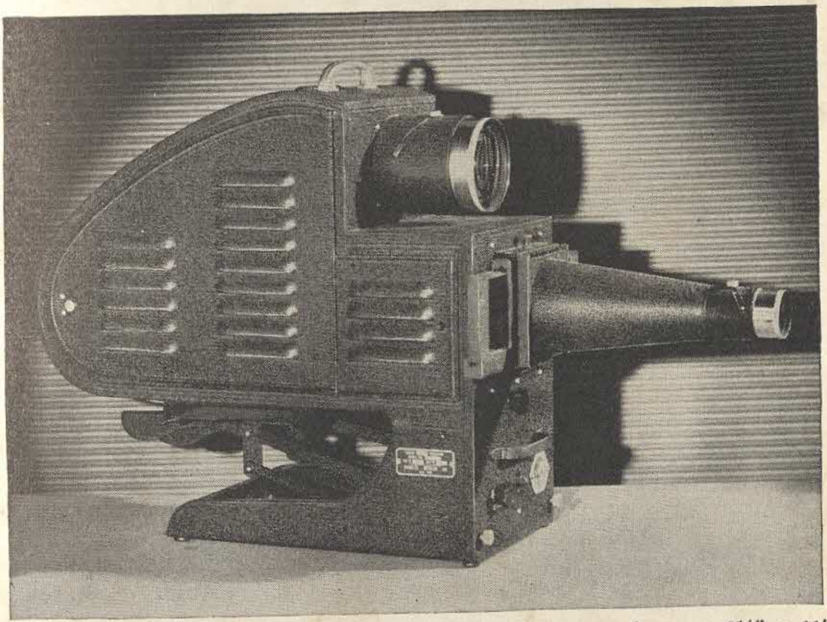

FIG. 3. This combination projector handles flat pictures as large as 8½″ x 11″ as well as lantern slides. (*Charles Beseler Company.*)

To secure best results and to facilitate ease and smoothness of projection, pictures or similar materials that have been cut from books should be mounted on stiff cardboard.

Nearly all opaque projectors are built to handle standard slides as well as opaque material, and, of course, all combination projectors are thus equipped. If desired, an attachment for handling the 35-mm. filmstrip and 2″ x 2″ slides may also be obtained.

The standard lantern-slide projector. This, a development of the old-time "magic lantern," is the projector with which most teachers are familiar because it has been used over a long period of years. The material to be projected is reproduced on a glass slide 3¼″ x 4″. The word "standard" is now applied to this size to distinguish it from the newcomer in the field, the 2″ x 2″.

One of the chief advantages of this projector is to be found in the large area through which the light passes. This means more light on the screen and, consequently, a more brilliant picture. Further, as sufficient light is provided, the machine may be used in a semidarkened room, and this enables the students to take notes while the picture is being screened. Another advantage of the lantern-slide projector is that it can be readily moved from room to room. It is also easy to prepare attractive, yet inexpensive, handmade slides for a wide variety of uses. For example, film and slides offer the student an opportunity to do creative art work and express his ideas, which may be viewed

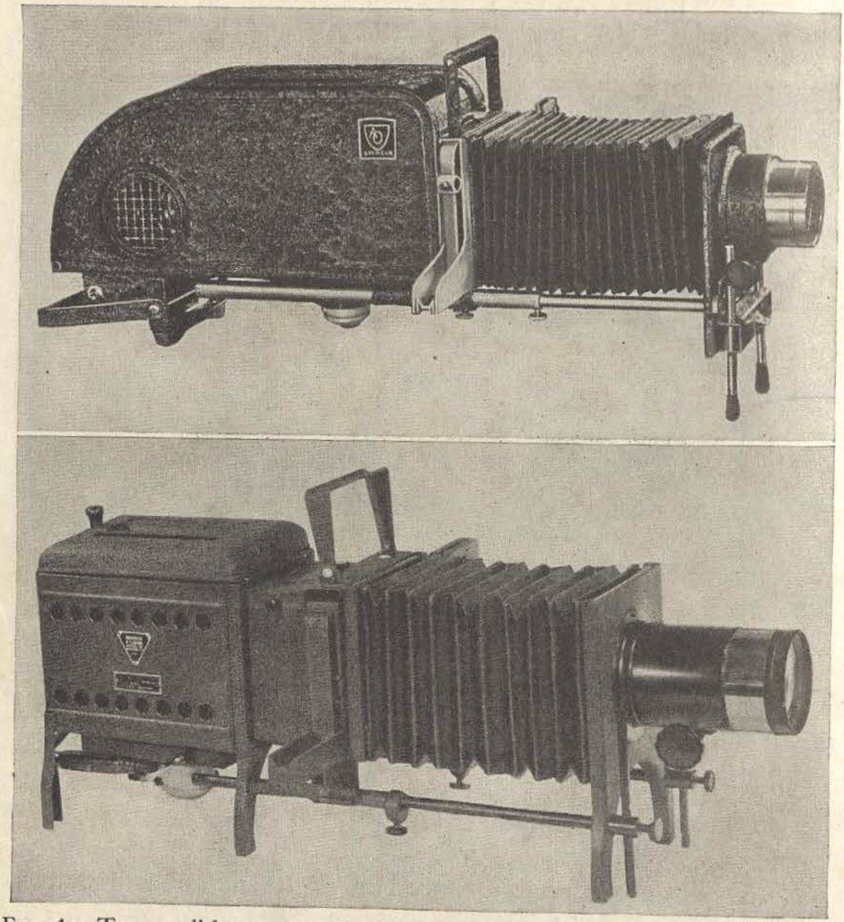

FIG. 4. Two well-known standard lantern-slide projectors, the Delineascope (top) and the Baloptican. (*American Optical Company, and Bausch & Lomb.*)

by the entire class. The simplicity of setting up and the ease of operation are two factors that have made this projector the choice for classroom use of hundreds of teachers.

The main disadvantages are (1) the slides are made of glass and are breakable; (2) slides are large and require considerable space for storage; (3) glass slides are heavy, and if rented, transportation costs sometimes exceed the rentals; (4) if the school plans to buy slides and build its own library, the cost is often prohibitive. However, if the school owns a photographic laboratory, this cost can be reduced considerably.

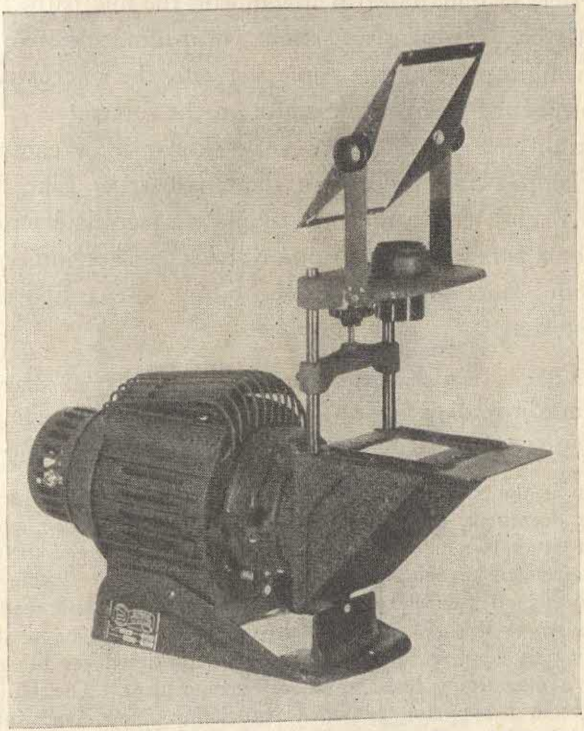

FIG. 5. When using the overhead projector the teacher sits at her desk, faces the class, and points out on the slide the items she wishes to stress. Every pupil can see and hear. (*Keystone View Company.*)

Overhead slide lantern. In regular lantern-slide projection there is a possibility of distraction when the teacher points out specific items on the screen by means of a ruler, stick, or pointer, and also while talking, she is not always facing the class. The overhead slide lantern is being used increasingly because it does away with these possibilities of distraction. The teacher, sitting at her desk, can indicate specific items on the screen by locating them with her pencil on the slide, and she can be easily understood because she is facing the class at all times.

Attachments for the lantern-slide projector. There are several devices that may be used advantageously on the slide projector—the 2″ x 2″ carrier, 35-mm. filmstrip attachment, the microattachment, and the Flash-Meter. The filmstrip attachment makes it possible to project the 35-mm. filmstrip. As the name suggests, the microattachment is used for projecting microscopic slides on the screen.[7]

The Flash-Meter[8] is a device very similar to a camera shutter which is clamped over the end of the lens barrel. Like the camera shutter the Flash-Meter may be set to allow a picture, a word, a series of words, or a paragraph to remain on the screen for intervals of time ranging from a fractional part of a second up. Regarding its purpose, the inventor states:

> The Flash-Meter was devised as an aid in instructional, diagnostic, and remedial work in reading. It can be used from the first grade to the university, inclusive.

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[7] Microfilm is the name generally applied to a very small photograph of a printed page, document, dissertation, manuscript, drawing, record, and so on, reproduced on either 16-mm. or 35-mm. film. It may be enlarged through projection to a convenient reading size. Hundreds of pages of valuable information may be recorded on a small roll of film and reproduced and read as desired. Viewing equipment is simple and easy to operate and can be used in a fully lighted room. In another form material is microprinted on filing cards and enlarged by a magnifying lens-and-mirrors arrangement. The Union Library, Philadelphia, and the Special Libraries Association, New York, are excellent sources of information on this subject. University Microfilms, Ann Arbor, Mich., is one of the best known of the microfilming companies.

Floating Words: The Story of Projected Books by Carol Lynn Gilmer, *Coronet,* vol. 24, pp. 125–130, August, 1948, is an interesting account of the development and utilization of the ceiling projector by means of which entire books are projected on the ceiling for bedridden patients. Today nearly six hundred microfilm books of every type are available. Information may be obtained from Projected Books, Inc., Ann Arbor, Mich.

Ultrafax is a recent development which combines television, radio relays, high-speed photography, and microfilming. On Oct. 21, 1948, in a demonstration of this new communications system, the complete text of "Gone With the Wind"—1,047 printed pages—was sent 3 miles across Washington in just 2 minutes and 21 seconds. Five minutes after reception the film had been developed and was readable.

[8] Distributed by Keystone View Company, Meadville, Pa.

The chief purpose of the inventor was to devise an instrument that would help to increase the recognition span, shorten fixation pauses, reduce the percentage of fixation pauses, help to eliminate regressions, develop good habits of concentration, and reduce lip reading in the lower grades.

To illustrate this use: if the phrase "in the morning" is flashed on the screen for one-fifth of a second, the child must read the whole phrase at a glance and not read it one word at a time. In controlled experiments excellent results have been obtained in the lower grades and equally satisfying results have been obtained in remedial work.[9]

The 35-mm. filmstrip projector. The machine is made to project pictures printed on a strip of film instead of on a glass slide. The strips range from 10 or 12 in. in length to as much as 3 or 4 ft. The number of pictures per strip varies from ten to more than a hundred, the usual number being between forty and fifty.

Each picture on the filmstrip is referred to as a "frame." The single frame measures ¾″ x 1″. Recently, double-frame projectors, in which each picture on the filmstrip is twice the area of the single frame, or 1½″ x 1″, have been produced. Some machines are designed to project either the single or double frame and, in addition, 2″ x 2″ slides.

The main advantages of the 35-mm. filmstrip projector are (1) it is very light and may be easily moved from room to room; (2) it is inexpensive; (3) the films require very little space for storage; (4) the films are inexpensive, varying from 3 to 6 cents per frame or an average of about $2 a roll; (5) filmstrips are obtainable from an ever-increasing number of sources; and (6) they can be easily made by the teacher and the students.

Two disadvantages of the filmstrip projector are (1) the room must be darkened more than is necessary when the lantern-slide projector is used; and (2) the pictures on the filmstrip are in a series and hence are not so flexible for use as are slides.

In general, if the school is planning to build up a library of projected still pictures, the filmstrip projector represents an ideal purchase.

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[9] Those who are interested in teaching reading will find the following booklet helpful: R. P. Carroll, "Reading-preparedness Tests and Exercises," Keystone View Company, Meadville, Pa., 1939 A very interesting experiment showing how visual materials are used for remedial reading is outlined in Improving Adult Reading through Visual Aids by I. H. Anderson, *Educational Screen*, vol. 26, pp. 195–197, April, 1947.

Several companies are now producing sound slidefilm projectors, which have record players to be used in combination with filmstrips. In the earlier forms of this combination a signal in the record, usually a bell tinkle, informed the operator when to turn to the next picture. In the more modern machine the filmstrip is advanced automatically by means of a high or low frequency note embedded in the record.

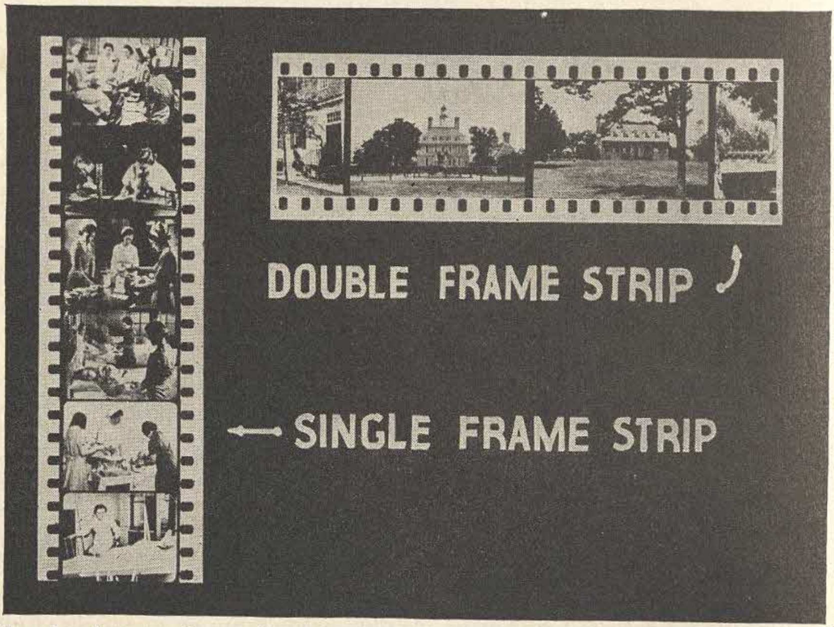

FIG. 6. A properly equipped projector can handle both the single- and the double-frame filmstrip. (*Society for Visual Education, Inc.*)

Thus, perfect synchronization is assured, and there is no audible note to interfere with the recorded material.

The 2″ x 2″ slide projector. This projector is made to handle the 2″ x 2″ glass slide, and many models of it are equipped to handle the 35-mm. filmstrip, either single or double frame. Most of the 2″ x 2″ slides are made by inserting one picture (double frame) from the 35-mm. filmstrip between two plain glasses. A filmstrip may be scratched and its sprocket holes torn. This makes for greater loss, especially with the more expensive color film. However, when mounted between glass, the slide may be used over and over again without danger of damage. The cost for mounting pictures of this type varies from 10 to 40 cents per slide, depending upon the type of film and the type of mount used.

These projectors are fitted with 100-, 200-, 300-, 500-, or 1,000-watt bulbs and, like the filmstrip projector, give better results in a well-darkened room. The use of higher watt bulbs gives fairly satisfactory results in a semidarkened room.

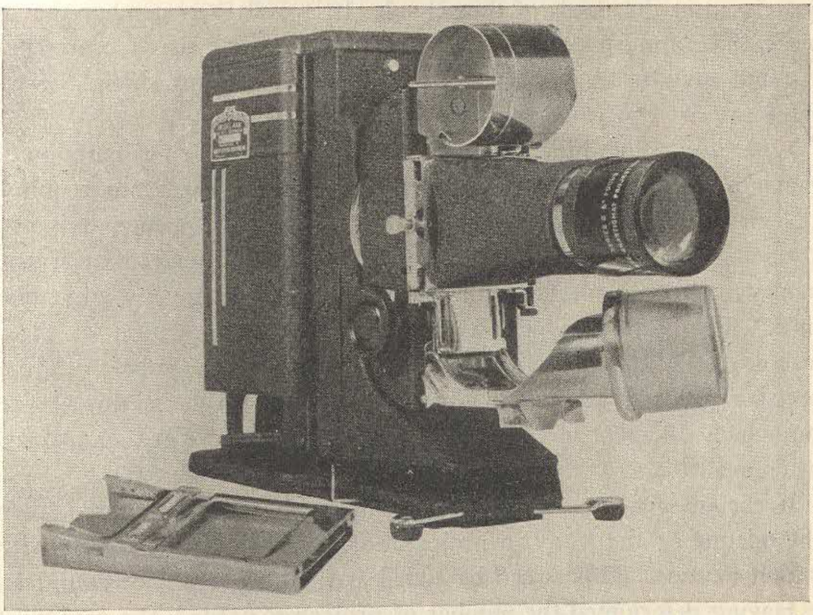

FIG. 7. The Tri-Purpose projector can be used with 2″ x 2″ slides and single-frame and double-frame filmstrips. (*Society for Visual Education, Inc.*)

One important advantage of the 35-mm. and the 2″ x 2″ projectors is the ease with which locally made photographs may be developed into a permanent library. Cameras using the 35-mm. film vary in price, but excellent pictures can be made with equipment costing less than $70.[10] If color pictures are desired, it is almost necessary to use a light meter. This meter gives the nearest exposure needed for the best results, not only with color film but with black and white as well.

In selecting a camera, the purchaser should determine the types of picture he is planning to take. For the usual outdoor scenes good results may be obtained with inexpensive cameras. For indoor photography, close-ups, and portraits, extra attachments, filters, tripods, floodlights, and a more expensive camera are necessary.

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[10] See p. 593 for a list of camera companies.

SELECTING A PROJECTOR

Although there are several factors to be considered when purchasing a projector, the most important is whether or not it will adequately meet the needs of the school. It is well to remember that a piece of equipment carefully selected (and properly used) represents a sound investment. A study of the following items should be of value to one who is held responsible for this selection.

Type. As pointed out above, each type of projector has certain advantages and limitations. A well-balanced school program requires at least one of each of the projectors discussed. However, it is not always possible to have all the projectors needed, and even if the money were available, it would hardly be expedient to buy all at one time. Therefore, the person responsible for the selection of these machines should choose those that will most adequately meet the pressing needs of the instructional staff and, at the same time, those for which sufficient materials to ensure substantial use are, or can be, made available.

If the budget for the audio-visual program is rather limited, then the opaque or the filmstrip projector will probably be the best with which to start. Others can be added as the budget is increased.[11]

Having determined the number of projectors needed, the user must next develop a purchase plan that is within the budget and yet one that will in a period of two, three, or five years provide adequate equipment.

Room. The rooms in which the projector is to be used should be considered. Most school people when selecting a book note the size and style of type and if it is not up to the standards for a given grade, reject it. Unfortunately, only a few teachers realize that there is a correct size for pictures, which, of course, varies with the size of the room. A picture that is too large or too small is not a good instructional tool.

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[11] To determine the number of projectors required to ensure best results in a given situation, see the check list and recommendations of the Committee of Fourteen, *See & Hear*, January, 1948.

For best results, the projector when in use should be as near the back of the room as possible, at least behind the back row of seats.[12] To determine the correct width of the image on the screen, divide the distance of the back row of seats from the screen by six; if the back row of seats is 24 ft. from the screen, the image should be 4 ft. or 48 in. wide.

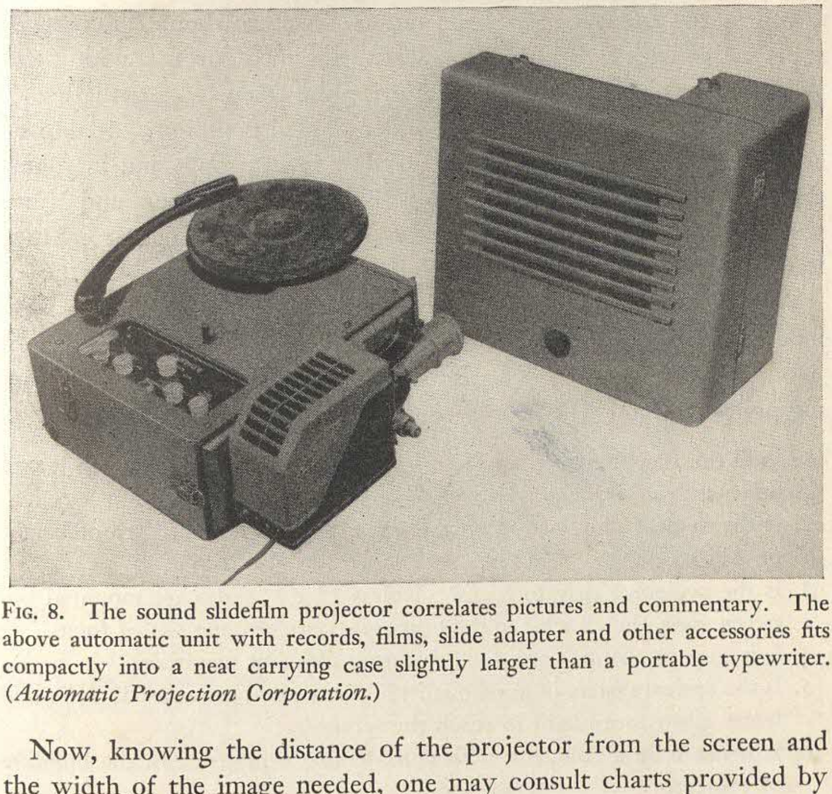

FIG. 8. The sound slidefilm projector correlates pictures and commentary. The above automatic unit with records, films, slide adapter and other accessories fits compactly into a neat carrying case slightly larger than a portable typewriter. (*Automatic Projection Corporation.*)

Now, knowing the distance of the projector from the screen and the width of the image needed, one may consult charts provided by the manufacturer of the projector and select the correct focal-length lens.

Obviously, since one projector will be used in several rooms and if these rooms vary in size, then a focal-length lens that will be suitable for all should be selected. If the projector is to be used in a large auditorium, an extra lens may be necessary for best results. However, in general, the focal-length lens that will give the best results in the rooms where the projector will be used most frequently should be selected.

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[12] Of course, this does not apply to the overhead projector, which is placed on the teacher's desk at the front of the room. However, the requirements of size and clarity of image do apply.

Lamps. Projectors, like any other machine, are built to meet the needs of many groups. The lamps used in the smaller projectors are usually 100, 200, or 300 watts; in the larger machines, 500, 750, or 1,000 watts. One would not expect a pickup truck to haul as heavy a load as the truck with a 4-ton rating. Neither should one expect a projector with a lamp of 200 watts, designed for use with small groups, to project a picture of sufficient size for a large gathering.

For the average classroom and under normal conditions, a lamp of at least 200 to 300 watts is essential. For small groups and in rooms that are equipped with dark shades, the smaller projectors and lamps will give satisfactory results. In the auditorium a projector with at least a 500-watt lamp will be needed for best results.

Cost. The cost of the projectors depends upon the make, type, and model, and these prices vary to such an extent that it is difficult to quote even an average price. However, it is well to keep the following points in mind when comparing prices of projectors.

1. Will this machine give satisfactory results in the rooms in which it will be used most frequently?
2. Is the field of illumination on the screen fairly even and free of bright or dull spots?
3. Is the projector easy to focus? Unless 2″ x 2″ slides are mounted between glass, they buckle in the heat and constantly get out of focus.
4. Is it easy to change parts for projecting different materials?
5. Is the optical system of good quality? Are coated lenses used? (Coated lenses allow more light to reach the screen.)
6. Is it made by a company with considerable experience in the building of projectors?
7. What arrangements, if any, are made for servicing it?
8. Is it easy to operate?
9. Is the tilting device such that it can be operated easily?
10. Is it easy to disassemble for cleaning?

Unless most of these questions can be answered in the affirmative, the machine is not a good buy, regardless of the price.

Attachments. In many instances the money spent on attachments may not represent a good investment. For example, suppose a school selects an opaque projector and adds attachments for standard and 2″ x 2″ slides and for projecting 35-mm. filmstrip. Although the school now has a multipurpose machine that will project all the different types of still pictures, it can be used by only one teacher at a time. If the teachers are using these materials extensively, then the opaque projector and a separate filmstrip, 2″ x 2″, or a filmstrip combination will more adequately meet their needs.

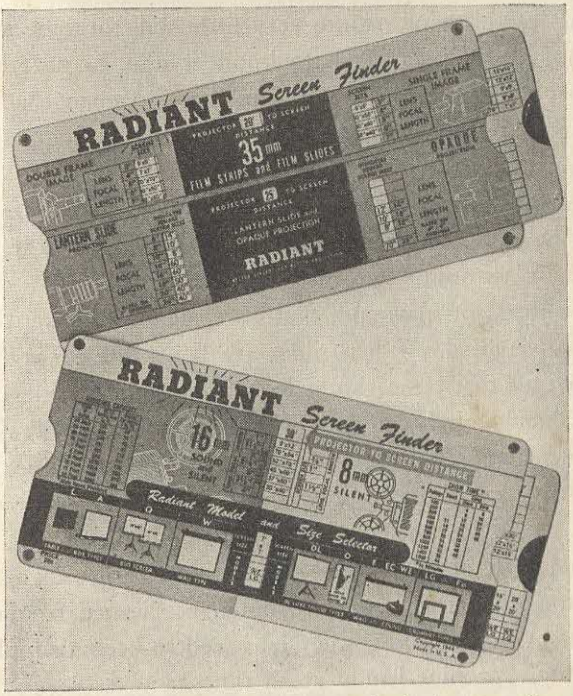

Fig. 9. By means of this Screen Finder the projectionist can select immediately the correct focal length lens. (*Radiant Manufacturing Corp.*)

Automatic slide changers, or devices that enable the teacher to stand by the screen and change slides by merely pushing a button, are available. Here again, before selecting such attachments, or machines thus equipped, the purchaser must decide if this feature is of sufficient value to justify spending the extra money for it.

Demonstrations. Preferably a projector should be tried out under the conditions of use. Generally, then, night demonstrations are less desirable than day demonstrations, which represent the actual teaching situation. Some distributors will leave the machines being considered by the school for a period of time for these tryouts, and probably others would–if they were asked.

OPERATION AND CARE OF PROJECTORS

Projectors of this type require very little skill for successful operation. About all the user needs to know is how to put the material into the machine, how to focus it, and how to change a lamp. All these steps may be mastered in a few minutes by studying the instructions accompanying each machine and by practicing.

Whenever possible, students should be appointed to operate the projector. This frees the teacher and allows her to be near the screen or about the classroom where her help is most needed.

Slides are made of glass and, therefore, may be broken if dropped or carelessly handled. When slides are being used, they should be placed in a tray that has a rim at least 2 in. high in order to prevent their being accidentally pushed off onto the floor. Trays or slide boxes should always be placed on a sturdy desk or table.

Because they contain very few moving parts, these projectors require little, if any, special care. They should be stored, well protected from dust, at a centrally located and easily accessible place. The reflector, condenser, and lens should be cleaned frequently with a soft paper or special lens tissue. It is well to keep a supply of extra lamps for each machine handy at all times.

SLIDES

Photographic slides. This is the type of lantern slide used most frequently by lecturers and teachers. It is prepared from the negative of a picture. The process is very similar to that followed in reproducing the negative on paper, except that a sensitized glass is used.[13] After the image on the sensitized glass is "fixed" and dried, a mat or border of paper about ½ in. wide is placed around the margin. A

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[13] How a special type of photographic slide is made by using leaves and sensitized paper is described in Leaf Prints and Pupil Interest by R. B. Power, *See & Hear*, vol. 2, pp. 28–29, April, 1947.

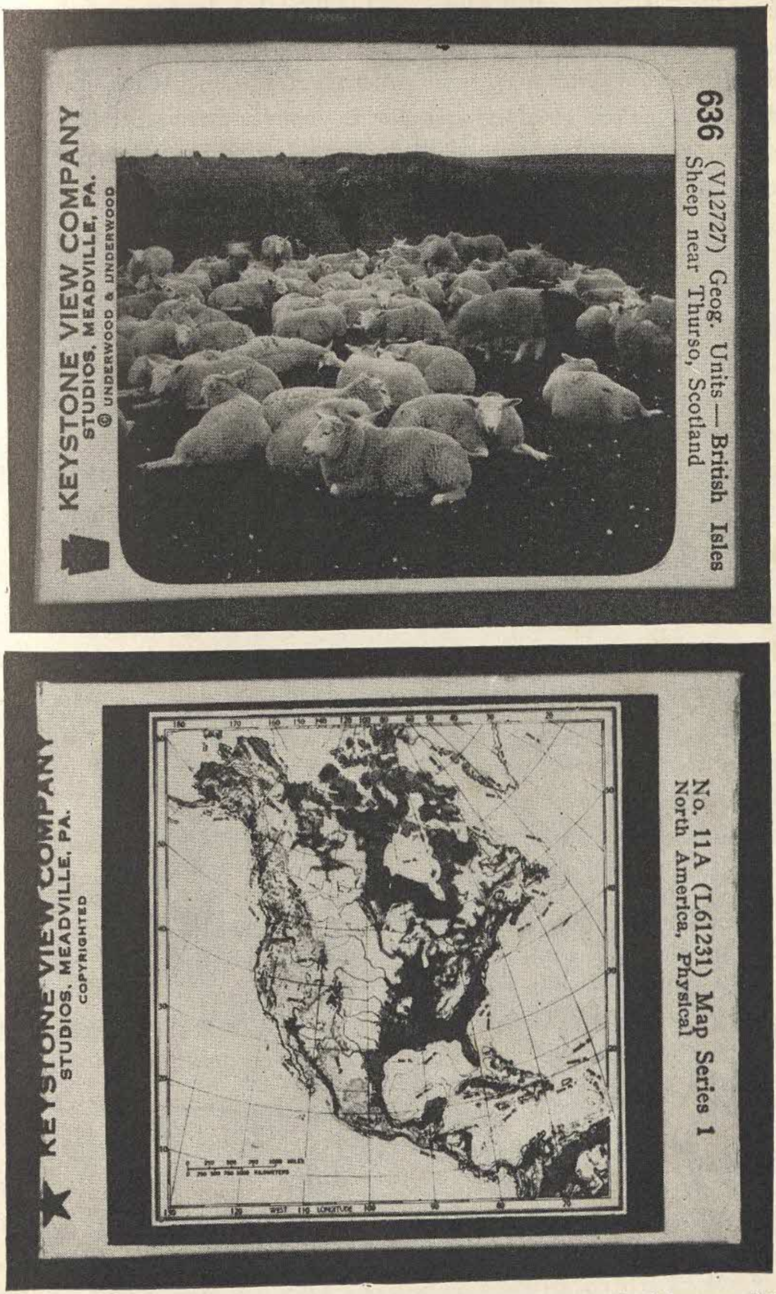

FIG. 10. A great variety of material may be presented on standard lantern slides. (*Keystone View Company.*)

clear piece of glass, called a "cover glass," is placed on top of the mat, and the edges are bound with a regular binding tape.

Photographic slides may be in either the traditional black and white print or in color. Naturally, color in many instances adds a great deal not only to the value of the picture but to its attractiveness as well.

If the school has access to a darkroom, students and teachers may find the production of slides an interesting activity, although it is well to remember that the slide is a teaching aid and should be considered from the standpoint of use in the classroom rather than as something to hold the attention of a few students who may be interested in producing it. But there is a place for school-made photographic slides.

School-made photographic slides.[14] As stated above, the type of pictures desired will determine the type of camera used. If it is to be used for both indoor and outdoor shots, then a higher speed focusing lens will be required. Inexpensive slides in both black and white and color are being increasingly made with the 2″ x 2″ camera.

The film must also be selected according to the conditions under which it is to be used. Color film is made for either indoor or outdoor use. By using a filter, one can use the indoor film satisfactorily for outdoor shots. Black and white film is made in a wide variety of emulsion speeds; by selecting the correct emulsion rating, one can take pictures under almost any light conditions.

If the slides are to be prepared for the school library, the following suggestions should be helpful:

1. Determine the subject area in which slides are needed.
2. If possible, on outdoor pictures use some means of framing the subject. This adds the third dimension, depth, to the picture.
3. Determine exactly how each picture will be used in the classroom, and prepare the necessary explanatory script to accompany it.
4. Select a subject with a suitable background.
5. List the subjects to be taken and study each one, carefully noting the time of day that the lighting is most suitable for taking the picture.
6. Take all outdoor shots at one time in order to avoid changing film for indoor work. This is not necessary if more than one camera is available.

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[14] Directions for making photographic slides will be found in E. C. Dent, "The Audio-Visual Handbook" (rev. ed.), p. 62–65, Society for Visual Education, Chicago, 1946.

The preparation of good photographic slides requires a great deal of time. Sometimes it will be necessary to spend several hours in selecting a suitable subject, determining the best angle and the most suitable background. Most good pictures are "good" because they were carefully planned; few of them were ever just snapped accidentally.

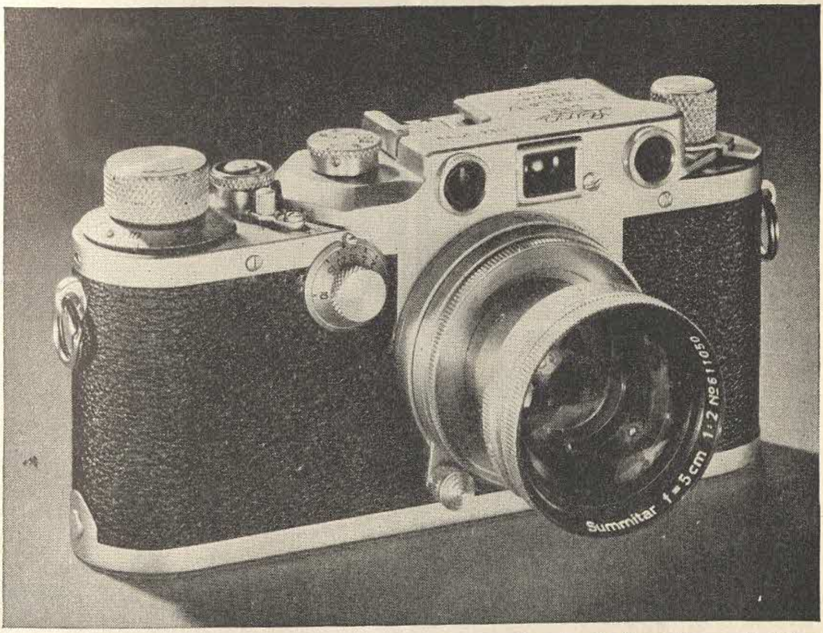


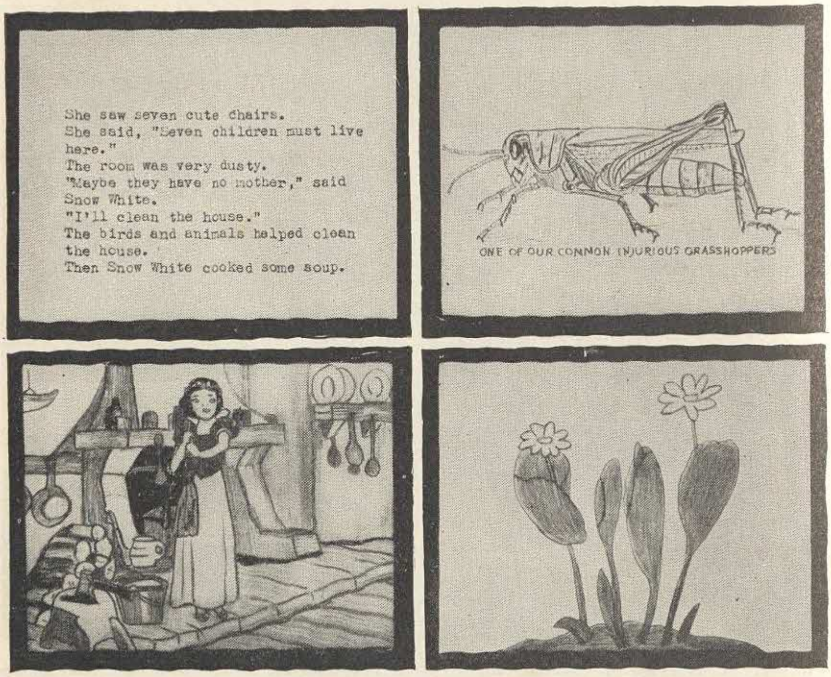
Fig. 11. This type of camera can be used for making both filmstrips and slides. (*E. Leitz, Inc.*)

Taking the picture. Hours spent in selecting a suitable subject may be wasted by faulty operation of the camera. The following suggestions should help the photographer to avoid some of the common errors.

1. The camera must not be moved when snapping the picture. If an exposure longer than 1/25 of a second is required, a tripod should be used.
2. The camera should be held level when taking the picture unless an angle shot is desired.
3. The subject should be carefully framed in the view finder before the picture is taken.
4. If the subject is moving, the picture should be taken as nearly from the front as possible.

5. After the correct exposure for the particular subject has been determined, the lens opening that will give the best results should be selected.
6. If there is a distance scale on the camera, be sure that it is set accurately.

The use of light filters will improve outdoor photography. These filters are fitted over the camera lens to prevent certain light rays from reaching the film. They are used to control sky brightness, to eliminate haze, and to develop contrast. Since the filters keep out some of the light, it is necessary to adjust the exposure to compensate for this loss. Before attempting to use filters, one should study the instructions very carefully.



She saw seven cute chairs.
She said, "Seven children must live here."
The room was very dusty.
"Maybe they have no mother," said Snow White.
"I'll clean the house."
The birds and animals helped clean the house.
Then Snow White cooked some soup.

ONE OF OUR COMMON INJURIOUS GRASSHOPPERS

FIG. 12. Here are four types of handmade lantern slides. The textual slide was typewritten on cellophane; the grasshopper was drawn on etched glass with a lead pencil; "Snow White," with lantern slide crayons; and the flower with slide crayons and inks.

Handmade slides. This term is applied to all types of glass slides not produced by photography. Handmade slides are of value as teaching aids because (1) they can be used to present material that cannot be presented in any other way; (2) they may be used by students to supplement or summarize a report or to present graphically a series of facts; (3) their presentation serves to motivate student interest; (4) they are inexpensive; and (5) the best of them may be bound for permanent use.

The parts of a glass slide are (1) the glass on which the image is drawn, (2) the cover glass used to prevent smearing the image, and (3) the binding tape. The mat mentioned in connection with the photographic slide is seldom used in the handmade one. However, a margin of about ½ in. should be left around the edge of the slide because the material in this area will not focus well on the screen.

There are several types of handmade slides, each of which serves a very definite purpose. The following brief directions will indicate how easily and simply these slides may be made.[15]

Etched-glass slides. This type of slide is most commonly used to reproduce charts, outline maps, graphs, diagrams, and other material of a similar nature. A kit for making these slides may be obtained at prices ranging from $3.50 to $14.50.

The etched slide is a plain piece of glass roughened on one side with an acid; then it can be drawn or written on with ordinary pencils as well as with colored pencils or ink. The image or picture is traced or drawn on paper in order that it will come within the 3¼″ x 4″ dimension of the slide. The glass, roughened surface up, is placed over the image to be reproduced and the tracing is made. The slide is now ready for use. If it is to be used several times, a piece of cover glass bound at one edge with tape will protect the etched surface from finger marks and smears. If the slide is to be added to a permanent collection, the four edges should be carefully bound. If not made for a permanent collection, the etched surface may be washed and the glass can then be used again.

Extreme care should be used in preparing these slides because the slightest error in tracing is magnified many times on the screen. A carelessly prepared, or inaccurately traced, slide loses much of its value as a teaching aid.

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[15] To promote interest in the use of handmade slides and to show how easily and quickly they can be prepared, the audio-visual instructor or director will find the 16-mm. color motion picture film "How to Make Handmade Lantern Slides" a real help. It is produced and distributed by the Audio-visual Center, Indiana University, Bloomington.

The attractiveness of the slide may be improved through coloring either with colored pencils or specially prepared ink. If the colored pencil is used, all strokes should be made parallel, and care should be exercised to make all shading or coloring of the same intensity.[16]

Colored ink may be applied with an ordinary pen or a soft piece of wood about the size of a toothpick. The ink should be applied near the center of the space to be colored and then worked out to fill in the outline. If more than one color is used on a slide, the first part colored should be allowed to dry thoroughly before the second color is applied. After the slide is used, the ink can be washed off with a special ink remover included in the kit. Regardless of how closely specific directions are followed, the first slides may be a bit disappointing. Actual practice, plus a bit of experimentation, should result in quite neat, artistic, and usable slides.

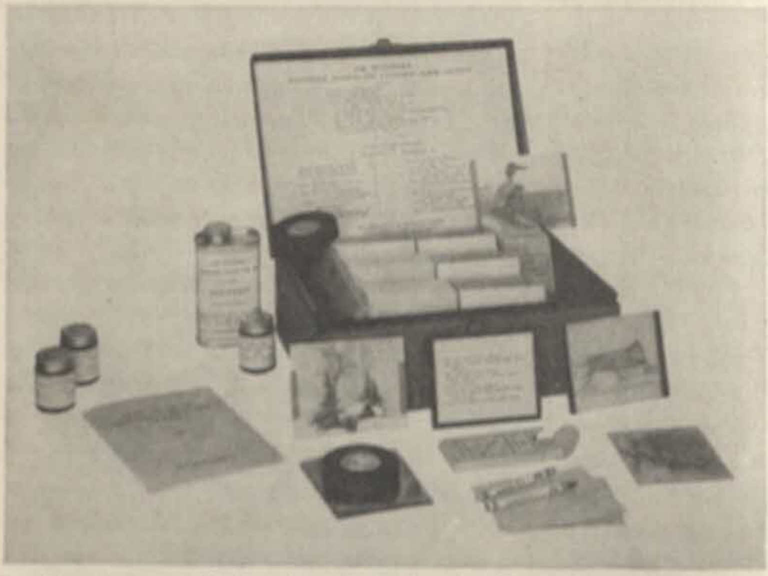

Fig. 13. An instruction booklet and all the materials required are included in this inexpensive slide-making outfit. *(Keystone View Company.)*

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[16] Those interested in enlisting the help of the more advanced students in preparing handmade slides for primary work will find interesting suggestions in Study of "Bambi," Inspired Movie Adaptation, F. Nacque-Adler, *Educational Screen*, vol. 22, pp. 292–293, October, 1943.

Plastic slides. Two disadvantages of the etched-glass slide are the dangers of (1) children cutting their hands and (2) breakage. By the use of plastic instead of glass, these dangers are obviated. In general, the procedures of making these slides are the same as those described above. These slides, too, can be bound, if desired. This type of slide is growing rapidly in popularity.

India-ink slides. A clear, bright outline or diagram may be produced by using India ink on a plain cover glass. A thin coat of shellac on the glass makes a better surface on which to draw.

Cellophane slides. This type of slide is used most frequently for projecting written material. To prepare it, first cut a piece of cellophane the size of the slide, 3¼″ x 4″. Second, cut a piece of carbon paper 4″ x 6½″ and fold the carboned sides together. Place the cellophane inside the carbon and write or type on the desired material. A great deal of time may be saved by typing and spacing the material on a plain piece of paper before putting it on the carbon. For clear typewritten slides use the typewriter as if cutting a stencil, that is, without ribbon. After the material has been prepared on the cellophane, place the sheet between two cover glasses and tape one side if the slide is to be used only once and all four edges if it is to be added to the permanent collection. Amber-colored cellophane is more satisfactory than uncolored.

Silhouette and cutout slides. Slides of this general type are of special interest to teachers of the lower grades. The figure to be reproduced is cut out of paper and then inserted between two cover glasses. If the object itself is used, the silhouette is obtained when the slide is projected. If the paper from which the object was cut is used, all the slide except the image will be dark. Cutout slides may be made more attractive by using colored cellophane. Sometimes several colors may be used advantageously.

EVALUATING PROJECTION MATERIALS

The criteria set forth in the preceding chapter for selecting flat pictures may also be applied to the slide or filmstrip since the projected picture is in reality a flat picture on the screen. When a picture is enlarged as it is when seen on the screen, many details hardly noticeable in the small print stand out quite clearly. Therefore, one of the first items of consideration, and a major one, is photographic quality. This should have the same technical excellence that contributes so much to the better Hollywood films.

Slides are usually selected in a series, and, of course, the pictures on the filmstrip are in a series. The thought or story to be brought out by the set should depend upon pictorial rather than verbal explanations. This is an important fact to keep in mind when previewing filmstrips because many have the same verbal explanation on the frame with the picture or on the frame preceding or following it. One must remember that the picture has a story to tell; if too lengthy a verbal explanation is necessary to make the story of the picture clear, then, as a general rule, the picture does not have much instructional value.

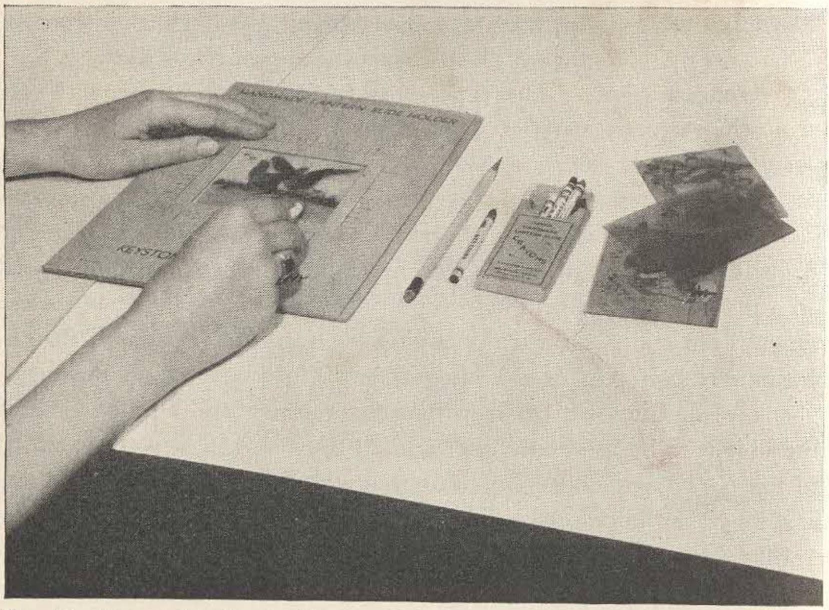

FIG. 14. Here a handmade slide, secured in the holder, is being colored with special crayons. (*Keystone View Company.*)

When these materials are used to develop an idea, they should not be discarded because they differ from those of the textbook. One of the basic values attributed to audio-visual aids is that of enriching the child's educational experiences. Hence these materials should have variety; they need not be limited to the ideas or thought of one particular text.

Obviously, no attempt to select materials by viewing them in any manner other than seeing them on the screen should be made. Unfortunately, the use of the 35-mm. filmstrip as a teaching aid has been retarded because of the poor materials that were made available for the schools. The titles were intriguing but the pictures were atrocious. Now, however, many companies are producing filmstrips in which the photography is excellent. Until the inferior materials have been weeded out, the user should insist upon previewing all filmstrips before purchasing them.

The type of mounting of slides should also be considered. If the slides are to be used extensively, then the glass mount will be the most desirable. If the slide is of such a nature that its use is limited to a few occasions, then the less expensive cardboard mount will be satisfactory except for the possible focusing difficulty mentioned previously.

STORAGE AND CARE OF SLIDES AND FILMSTRIPS

To facilitate the use of the audio-visual materials, slides and filmstrips must be filed and catalogued in order that they can be located easily. They must also be protected when not in use.

Slides of either the standard or the 2″ x 2″ size are generally kept in boxes that will hold up to fifty or more. Each slide can be placed in an individual compartment by using cardboard dividers. The name of the set should be stamped or printed on the box. Each slide should be numbered and titled. Whenever possible, this list should be pasted on the lid of the container. In addition, an alphabetical list of all slides owned should be prepared in order that the teacher may, without discouraging and time-consuming difficulty, select a set of slides or several slides from different sets to meet the needs of her class.

Some storage cabinets are made up of frames that will hold forty to sixty standard slides. These frames, when pulled from the cabinet, make it possible for the teacher to look at each slide without removing it from the frame. This feature may justify the additional expense for such a cabinet. Another helpful device is a small cabinet with a frosted glass cover over small electric lamps. The teacher may preview the slides by placing them on this cover.

Filmstrips are usually stored in small metal containers. These containers are only a little over 1 in. high, and 36 of them can be placed in a drawer or file 2 in. deep and 12 in. square. Steel cabinets with drawers of suitable dimensions for storing these containers may be secured at a very reasonable cost.

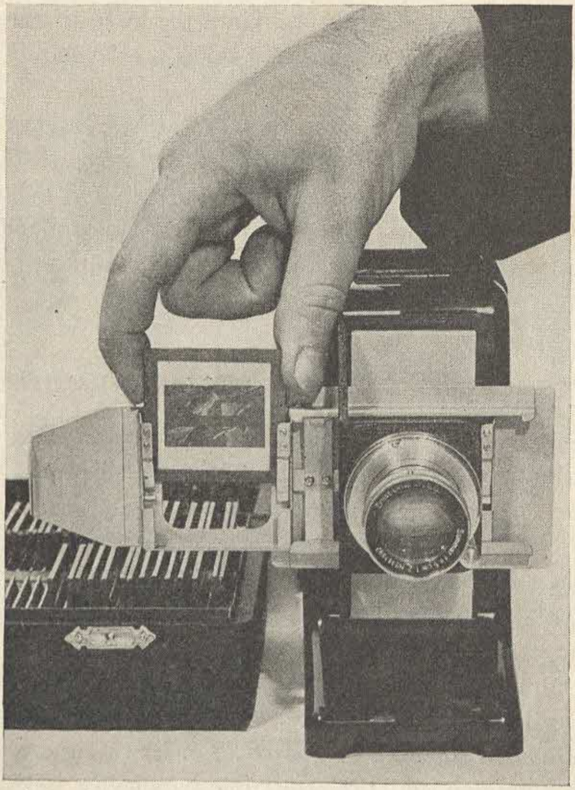

FIG. 15. Inserting a lantern slide in the carrier of a 2″ x 2″ projector. Note the storage box. (*E. Leitz, Inc.*)

The filmstrips, too, should be catalogued. A manual to accompany each filmstrip with explanations of each scene should be prepared for the teacher's use. Some commercial filmstrips are accompanied by such manuals; others have the directions for use built into them. Incidentally, these manuals are easily mislaid, or lost; hence some system of filing and checking is necessary.

When handled, slides or film should be held in such a way as to avoid leaving fingerprints on the area that will show on the screen. Such marks, if made, may be removed with lens tissue or better still by carbon tetrachloride.

The system of storing these materials must be such that they can be readily checked out by the teachers planning to use them. If, in order to secure a projector and a set of slides or a filmstrip, the teacher is required to waste a lot of valuable time on forms or other red tape, the aids will probably go unused. At the same time, some system is necessary in order that the material may be efficiently utilized and protected.

In many schools, the trend is to handle all audio-visual materials through the library. The librarians are familiar with cataloguing and filing, and a few hours of instruction is sufficient to enable them to take care of these materials. A card file of audio-visual materials should be available for the teacher's use. In other words, the teacher should be able to get a filmstrip or a set of slides from the library just as she does a book.[17]

THE SCREEN

The room in which the projector is to be used must be considered when a screen is being selected. If the students will be seated at a wide angle from the perpendicular to the screen, then a plain white screen is best. If, however, the students will be seated almost directly in front of the screen, a glass-bead screen is preferable.

The clearness or vividness of the image is due to the amount of light reflected by the screen. Since the glass beads reflect a greater portion of the light reaching them, this type of screen is best for all-around use. A highly reflective surface is a "must" for good results with slides or filmstrips in color.

There are three common types of screen mounting—wall, desk, and tripod. The wall-mounted screen is attached to a bracket or enclosed in a dustproof case and hung on the wall. The screen is rolled up when not in use. The desk type is mounted in a long, narrow dustproof box. The box, when opened, serves as a base, and the screen is held in position by braces. This screen is handy to use, requiring only some object on which to rest. The tripod screen is mounted in a dustproof case and supported on a three-legged stand. If the projector is to be moved from room to room, either the desk or the tripod type of mounting will be more satisfactory than the wall type.

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[17] See also the discussion of the audio-visual center on pp. 551–554.

When mounting the wall type or when selecting some piece of furniture on which to set the desk-mounted screen, one should see that the bottom of it is no lower than the eye level of the students. Most tripod screens are adjustable, and the height can be regulated as needed.

Further, a screen should be selected which will make possible a picture of the correct size in any of the rooms in which it will be used. As pointed out previously, the correct width of the image is determined by dividing the distance of the back row of seats from the screen by six. Hence, if in the smallest room this distance is 24 ft. and in the largest, 36, then an image 48 in. wide is required in the first, and 72 in. in the second. If one screen is selected for use in both of these rooms, it must be 72 in. wide.

Students should be required to sit in the best viewing area when a picture is being shown. They should not be permitted to sit nearer to the screen than twice the width of the picture. In some schools the floors are marked to prevent the students from sitting too close. If seats are stationary, those outside the viewing angle or those too close to the screen should be marked and not be used. If movable, they should be placed in the proper positions before the picture is shown.

PREPARING THE CLASSROOM

There are several other classroom elements that must be considered when projectors and screens are being selected. One of these is the method of darkening the room because best results will be obtained when most or all outside light is eliminated.

In some schools a central room is provided for the classes using projected materials. In one way this is disadvantageous because audio-visual materials cannot make their maximum contribution to the educational program unless correlated with all other materials of instruction. This correlation is difficult unless these materials are used in the classroom. Furthermore, moving the class to another room takes it out of its regular environment and brings distractions. Dark shades or some means of darkening the windows should be provided ultimately for every classroom.

If shades are used, unless they overlap sufficiently, channels of some sort are needed to keep the light from coming in around their edges. Draperies are more expensive, but they are superior to shades because they can be closed more quickly and, if weighted, make some ventilation possible while the room is darkened.

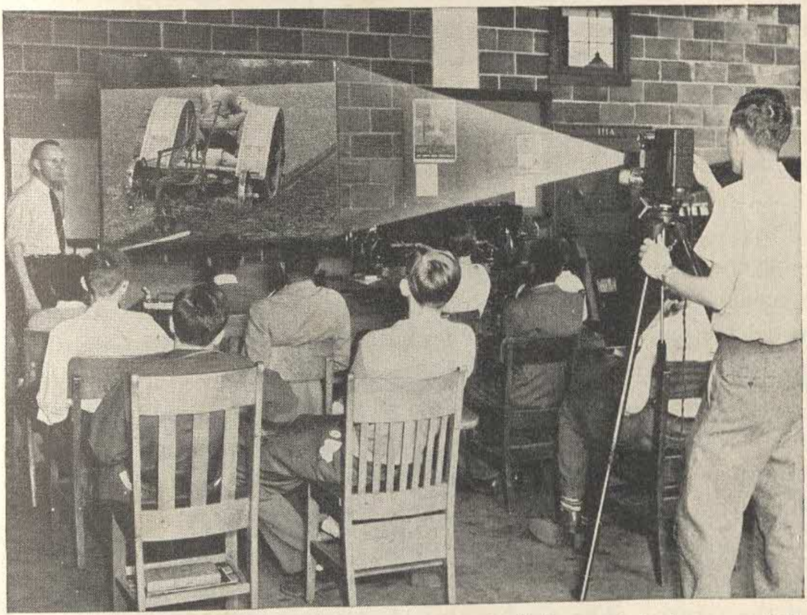

FIG. 16. Good projection technique; the picture is distinct and the bottom of the screen is at eye level. (*Society for Visual Education, Inc.*)

The room should be darkened so that no light falls upon the screen. If the screen is dark, then the only concern is for light that may shine in the viewers' eyes.

Darkening all rooms is a rather expensive procedure but a necessary one if audio-visual materials are to be used to their best advantage. It would hardly be expedient to buy all darkening material at one time, but a definite sum should be appropriated for this purpose each year in order that at the end of a certain period all rooms will be equipped.

Electric outlets should be available in every room. If not already installed, they should be placed in such a way as to require little, if any, extension cord. For most rooms these outlets or plugs can be located in the wall or floor.

It is also desirable to spot the floor with a small point of paint to indicate the place where the screen should be set. A spot of paint may also be used on the projector of similar color as the one on the floor; then the teacher will know where to place the projector for the correct size image. Carrying out these suggestions will require some time, and while they may seem trivial, they will enable the teacher to use projected audio-visual materials more efficiently and more effectively.

TEACHING WITH PROJECTED MATERIALS

Several suggestions for teaching with pictures were discussed in the preceding chapter. These procedures are also applicable to the projected picture. To secure the best learning situation there are, however, other factors to be observed when projected pictures are used.

Mechanical factors. Getting the picture on the screen involves the use of some kind of a projector. The teacher should not only know how to put the material in it and how to focus it, but she should be able to operate it easily and smoothly. One slide in wrong, a flash of white light on the screen, or any other similar distraction soon focuses the attention of the class on the operation of the machine instead of on the screen. The teacher should always remember that the best planned visual lesson can be ruined by faulty operation of the projector.

Considerable attention should be given to getting the equipment ready in order that it can be used when needed. The projector should be checked and focused before the class meets. The first picture should be in the projector in order that the room can be darkened and the picture thrown on the screen at once.

Still-picture projectors are simple to operate, but the teacher will find it well worth while to practice with them until she can use them easily and with little or no effort.

Instructional techniques. Because the attention of the entire class is focused on the picture, the teacher, to keep the attention on the picture, must give the pupils something to look for. In other words, she must have a definite purpose for using a particular picture, and the students must know what they are expected to see in it.

A common error in using slides and filmstrips is that the operator does not leave the picture on the screen long enough for the students really to study it. Haste in projecting pictures will mean incomplete visualization and understanding. On the other hand, leaving a picture on the screen too long will mean decreased interest in it.

Each picture has a story to tell. The skilled instructor will gauge her explanation in such a way that when the eye has taken in the visual story, the verbal explanation will have been completed. She will need to observe the class very carefully in order to determine the proper length of the verbal explanation. Teachers should remember that they can give more explanation than is necessary. They should allow the picture to give as much of its own story as possible.

There is also a hidden story in the picture that will add much to its value as an instructional tool if the students are taught to look for it. For example, suppose the instructor has selected two slides, one showing several combines, one behind the other on a wheat ranch in Canada, the other showing a combine on an Illinois farm. Such questions as these are pertinent: What do these slides tell about the size of the two farms? Which area is best adapted for growing wheat? Or again, suppose the class is looking at a picture of a Southern farmer plowing corn with a one-horse cultivator: What does this picture tell about the size of the field? About the standard of living of the farmer?

Careful study by the teacher of each picture will enable her to formulate questions that will help the students get the full story it has to tell. To enable the students to interpret each picture the instructor should relate it to their own experiences. Discussion of the known items in the picture will enable them better to interpret the unknown.

Uses of the projected picture. There are many ways in which the projected picture can be used to good advantage. The following are illustrative:

1. To introduce a unit of work
2. To give information on a particular topic or phase of the unit
3. To test the students
4. To prepare the class to see a motion picture
5. To prepare the class for a field tour
6. To contrast methods, such as in farming or industrial production

7. To project pictures or maps on the blackboard to be filled in or traced by the student
8. To illustrate student talks
9. To serve as follow-up activities for the field tour or motion picture
10. To serve as a means of rapid review
11. To give the students information on specific types of work

It is impossible to list all the ways in which the projected still picture can be used, and the more the teacher uses these materials, the more ways she will discover to make them a part of her regular instructional procedures.[18]

Illustrative titles. The following list of titles of 35-mm filmstrips will indicate what a wealth of material is available for classroom use. Many additional titles are to be found in health, mathematics, science, and physical education.[19]

Foreign Policy 1918–1941
Fishermen of Gloucester
Life of the Eskimo
Louisiana Purchase
A Day in Ancient Egypt
Dolls of Many Lands
Colonial America
Locomotives at Work
History of Land Transportation
How to Develop a Good Vocabulary
The Comma
The Semicolon and Dash
Subject and Predicate
The Needs and Purpose of the United Nations Charter
On the Farm with Tom and Susan
  Visiting the Farm
  Animals and Their Young
The Pancake
Three Little Pigs
I Live in the City
Simple Machines
Animals to Know
The Prepositional Phrase
Punctuation Express
Our Federal Government
Democracy at Work

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[18] Interesting accounts of how this device may be used in an examination will be found in The Strip Film, An Examination Procedure in English Composition, by Joseph Jones, *Educational Screen*, vol. 26, pp. 487–498, November, 1947, and J. W. Brown, Visualized Testing, *Educational Screen*, vol. 28, pp. 116–117, 130, March, 1949.

[19] The filmstrip is now being used extensively to develop better international relations. The Department of State has produced hundreds of filmstrips on various countries of the world, and information concerning them may be obtained from this office. A pertinent report is "International Trends in Visual Education," U.S. State Department Report on World-wide Filmstrip Utilization, by Elizabeth Lundell, Department of State, Washington, D.C.

The list of 2″ x 2″ slides is just as long and covers almost as many subject areas. The following are illustrative titles:

Birds and Their Young
Life History of the Monarch Butterfly
North American Reptiles
Flowering Shrubs
Summer and Autumn Wild Flowers
The Vegetables We Eat
Summer
Mountains
Great Artists Paint Life on the Farm
Italian Renaissance Sculpture
Christmas Customs in Many Lands
Easter Customs in Many Lands
Middle Atlantic States—The People and Their Work
Zion and Bryce Canyon National Parks
Yosemite National Park
Children of Mexico
Ireland, Its People and How They Live
The Gingerbread Boy
Farm Animals
Shrines and Symbols of American Democracy
Spanish Missions of the Old Southwest
Indians of the Southwest
Central States—The People and Their Work

Placing the materials best suited to a particular grade level and to a given topic or unit will be one of the major problems of the instructor and the audio-visual director. Desired materials can be easily placed by reference to two "must" books for every school library: "Filmstrips—A User's Guide and Descriptive Index,"[20] and "The Educational Film Guide."[21]

Correlating the projected picture with other instructional aids. Recently, one of the authors, while on a school visit, was walking down the hall and just happened to look into a classroom where visual aids were being used. On the screen was being shown a picture of a bird in natural color. The class was listening to the song of the bird on a phonograph record. After looking at the picture and listening to the record, the members of the class were shown a mounted specimen. The instructor was preparing the group for study in the field. Here three different aids were nicely correlated to help the students learn to identify birds.

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[20] By V. M. Falconer, McGraw-Hill Book Company, Inc., New York, 1948. This book lists and annotates more than 3,000 filmstrips.

[21] By D. E. Cook and K. M. Holden, The H. W. Wilson Company, New York, 1949. (Published annually.)

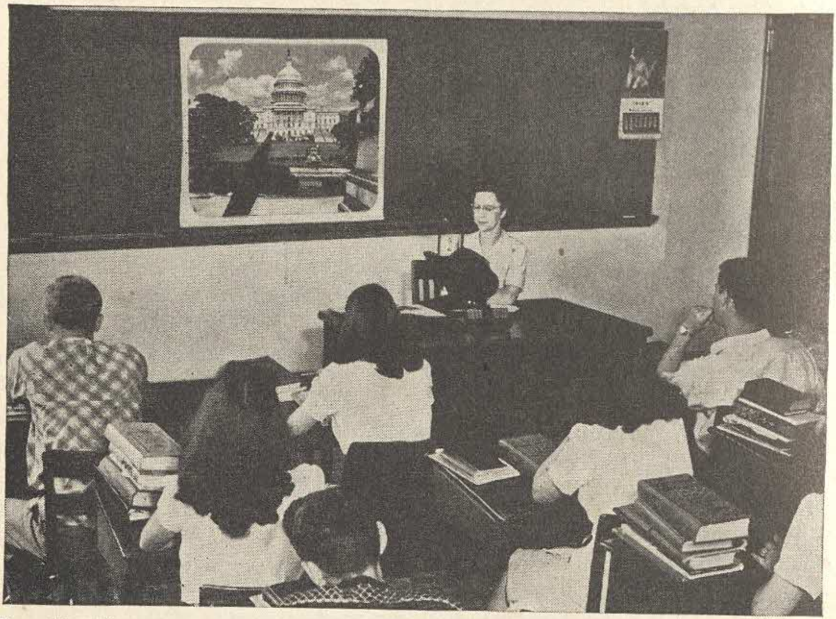

FIG. 17. The overhead projector in use. Note the teacher's pencil pointing out a particular item in the picture. This projector is also easily adaptable to 2″ x 2″ slides, filmstrips, and the Flash-Meter. (*Keystone View Company.*)

Some producers are making filmstrips to accompany their motion pictures. These filmstrips are very helpful in preparing the class to view the film and in developing follow-up activities.

Using the picture to supplement the text, to round out map work, to explain a laboratory procedure, or to dramatize certain safety measures places it on the level with other instructional material.

In conclusion, may we reemphasize that the instructor should (1) be able to operate the projector with ease and confidence, (2) use only a few pictures during any one period, and (3) assist the students in getting the story the picture has to tell, and (4) correlate the picture with other instructional materials.

The continued production of better materials, the ever-increasing interest of teachers in projected still pictures as aids in teaching, and the use of these materials, especially 2″ x 2″ slides and filmstrips, by publishers to supplement their textbooks indicate that the projected still picture will soon become one of the most widely used visual aids.

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9

THE MOTION PICTURE

I: VALUES, SCOPE, AND USES

In 1456 John Gutenberg took from his press a copy of the Bible, the first book ever to be reproduced by the art of printing. Within a few years the printing press came to be looked upon as one of the greatest inventions of all times. As one thinks back over the centuries that have elapsed since then, it is impossible even to attempt to evaluate printing in terms of its contributions to civilization of today.

The twentieth century has witnessed the development of another epoch-making invention, evaluated by George P. Zook in his report to the American Council on Education as "the most revolutionary instrument introduced in education since the printing press"—the motion picture. This invention in the space of a few years has revolutionized the form of entertainment throughout the world and is coming to be recognized as one of the most dynamic of all teaching aids. It is possible that, in the years that lie ahead, the motion picture may even excel the printing press as a disseminator of information.

Progressive school administrators and instructors have long recognized the educational potential of the motion picture. Now that certain problems that have had a tendency to retard the more extensive use of films in the schools are being solved, the motion picture will be given its rightful place in the educational program.[1]

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[1] The most complete and lucid article on educational films that the authors have seen in a popular magazine is Hubert A. Kenny's Going to School with the Movies, *American Mercury*, vol. LXV, pp. 36–42, January, 1947. The article ends with this paragraph: "No people have ever poured money into education as have the Americans. But the fact remains that today less than 20 per cent of our public schools have even the facilities to begin teaching by means of the most

History of the motion picture. Historical records indicate that the fundamental principle of the motion picture was first discovered and used by the Chinese many centuries before the birth of Christ. This principle is based on the fact that when an object at which one is looking is suddenly removed, the image remains on the retina of the eye for a fractional part of a second. This is referred to as persistence of vision. When a series of still pictures, each just a bit different from the one preceding it, is flashed before the eye, the pictures seem to have acquired the quality of motion. Today the theater audience sees a series of still pictures flashed on the screen in rapid succession. These pictures are changed so rapidly and smoothly that motion seems to be an inherent quality. The individual is not aware of the fact that he is really looking at still pictures. If the motion-picture projector is being operated at lower than the correct speed, a flickering of the picture on the screen is noticeable. This disappears as soon as the machine is running at normal speed. On the 16-mm., 400-ft. classroom film there are approximately 16,000 pictures or frames. These pass through the projector at the rate of 16 frames per second in the silent, and 24 frames per second in the sound, machine.

Early experiments with motion pictures were based on drawings and resembled somewhat the animated cartoons of 15 or 20 years ago. These were not projected but were used in a sort of "peep-box" device. The earliest attempts to produce a photographic motion picture were made with several cameras. This was necessary because glass plates were used. When George Eastman of Rochester, New York, perfected the celluloid film, the way was paved for the motion picture of today.[2]

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efficient method ever discovered—proved thirteen years ago beyond all doubt. It is high time for parents and teachers to begin asking their school boards for an explanation."

Another very interesting and incisive article, which says among other things, "After a third of a century visual education still plays a relatively insignificant part in today's education in instruction [because of] plain bull-headedness on the part of America's commercial organizations . . . plus a lesser measure of educational conservatism on the part of most people," is Visual Education: Bountiful Promise, Tragic Trickle, by Joseph M. Tewinkel, *Clearing House*, vol. 20, pp. 515–518, May, 1946.

[2] "Magic Shadows" by Martin Quigley, Jr., tells the interesting story of the origin of motion pictures. (Published by Georgetown University Press and is

The next development was the kinetoscope invented by Thomas A. Edison. This machine did not project pictures but was arranged for a person to look into a machine and view pictures that seemingly possessed power of motion. The kinetoscope attracted considerable attention at the Chicago Fair of 1893.

The credit for the invention of the motion-picture machine must be given to two Americans, C. Francis Jenkins and Thomas Armat, and one Frenchman, Auguste Lumière. Through the individual and cooperative efforts of these men the projector was perfected. Shortly after the turn of the century the motion-picture theater became an established institution. In a relatively short period of time motion-picture production has grown until it is now ranked as one of the leading industries of the United States.

Development of the motion picture in education.[3] The inventors of the motion picture early recognized its great potential as an instructional tool. However, its first and most rapid development was in the field of entertainment.

To provide entertainment for the soldiers in the First World War the portable 35-mm. projector was developed. At the close of the war the schools showed considerable interest in the motion picture as a possible part of their instructional program. Many schools purchased projectors, only to find that educational films were very, very scarce, and those that were available were so expensive that only a few schools could use them.

Unfortunately, this situation retarded the whole audio-visual movement for quite a period of time. However, it did raise several ques-

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available through Quigley Bookshop, 1270 Sixth Ave., Rockefeller Center, New York 20, New York.)

It is interesting to note that the first attempt to make motion pictures was made in order to win a bet on a horse race. Strange as it may seem, the area destined to become the center of the motion picture industry of the world was given the name of that horse—Hollywood.

[3] The most complete and authoritative history of this field, written by a man intimately associated with it for more than thirty years, is Arthur E. Krow's series of articles, Motion Pictures—Not for Theaters, which appeared in *Educational Screen* from September, 1938, to June, 1944.

F. D. McClusky's article, Will the Film and School Join Hands?, is a good shorter account of some of the high spots in this historical development. It will be found in *Education*, vol. 58, pp. 449–453, April, 1938.

The references for this and the following chapter will be found on pp. 242–245. (See also the list of sources on pp. 591–593.)

tions concerning the use of the motion picture as an integral part of school instruction. Some of them were: Can motion pictures be produced that will contribute to accepted educational objectives? Can they be correlated with other instruction materials? If so, can their contribution be measured? Will this contribution be sufficient to justify the cost of the film? Can the price of projectors and films be decreased?

The above questions served as a basis for numerous studies, surveys, and experiments, many limited to small groups and others on a nationwide basis. Probably one of the most extensive and most conclusive studies was made by Wood and Freeman.[4]

The perfection of the 16-mm. projector made possible simpler projectors and less expensive films, and these paved the way for the rapid development that came during the thirties. The next development was the perfection of the 16-mm. sound film, and this opened a whole new field of research to determine the relative merits of the sound and the silent film. Today most educators recognize that each of these has its place in an instructional program. Then came the Second World War. It is not necessary to refer to the training program of the armed services other than to call attention to the fact that every branch used motion pictures extensively as a basic part of its instructional program.[5]

The G.I. training program, the publicity given to it, and a desire on the part of administrators and instructors to improve the educational experiences of boys and girls have led to an unprecedented wave of interest in the use of motion pictures as well as in other types of audio-visual aids. The manner in which producers and distributors of audio-visual equipment and materials are cooperating with the teachers and administrators of public schools is indicative of sustained and increased interest in the use of this medium of instruction.[6]

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[4] For a detailed report of this experiment see "Motion Pictures in the Classroom" by Ben D. Wood and Frank N. Freeman, Houghton Mifflin Company, New York, 1927. An illustrative recent investigation into the possibility of improving educational motion pictures is Joe Park, An Analysis of the Verbal Accompaniment to Classroom Sound Films, *School Review*, vol. LII, pp. 420–426, September, 1944. This study undertook to answer two questions: (1) Is the vocabulary burden of classroom sound motion pictures excessively heavy? (2) Are the sentences in the verbal accompaniments too long?

[5] Three books that describe the use of audio-visual materials in this program are C. F. Hoban, Jr., "Movies That Teach," The Dryden Press, Inc., New York, 1946; J. R. Miles and C. R. Spain, "Audio-Visual Aids in the Armed Services," American Council on Education, Washington, D.C., 1947; and William Exton, Jr., "Audiovisual Aids to Instruction," McGraw-Hill Book Company, Inc., New York, 1947.

ADVANTAGES AND LIMITATIONS OF THE MOTION PICTURE

As in the case of almost any other device, procedure, or process, there are both advantages and limitations to the motion picture.

Advantages

Depicting motion. The chief function of the motion picture is to depict motion, and motion implies continuity. If motion is not an essential part of the representation, a still picture will serve instructional purposes more adequately. Motion, for our purposes here, may be classified as observable and unobservable. The motion picture very effectively reproduces both. Sound and color bring to the classroom an element of realism that cannot be attained by any other medium of instruction.

Observable motion. Through motion that is observable to the human eye, complete processes, which normally extend over a long period of time and which take place in various sections of the country, may be recorded on the motion-picture film and brought into the classroom. This is the only method by which such information can be made available for the teacher's use.

The film "Woolen Goods" is a good illustration of this advantage. In this film the student sees (1) the animals that produce wool; (2) the methods of shearing; (3) the processes of cleaning, carding, and

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[6] A gift of $1,800 was recently made to Indiana University by the Indiana Visual Aids Company of Indianapolis for the purpose of employing graduate students to undertake studies in the correlation of films with the more widely taught subjects in Indiana schools.

Fifteen American universities were selected as the recipients of the 1949 Encyclopaedia Britannica Films tuition scholarships for summer study in audio-visual education. Each will choose its own scholar. The sole requirement for a scholar is that he or she be a teacher or school administrator with special responsibility for audio-visual instruction. Floyde E. Brooker, Chief, Audio-Visual Aids, U.S. Office of Education, is Chairman of the Selection Board. The other five members are well-known teachers, directors, and writers in the field.

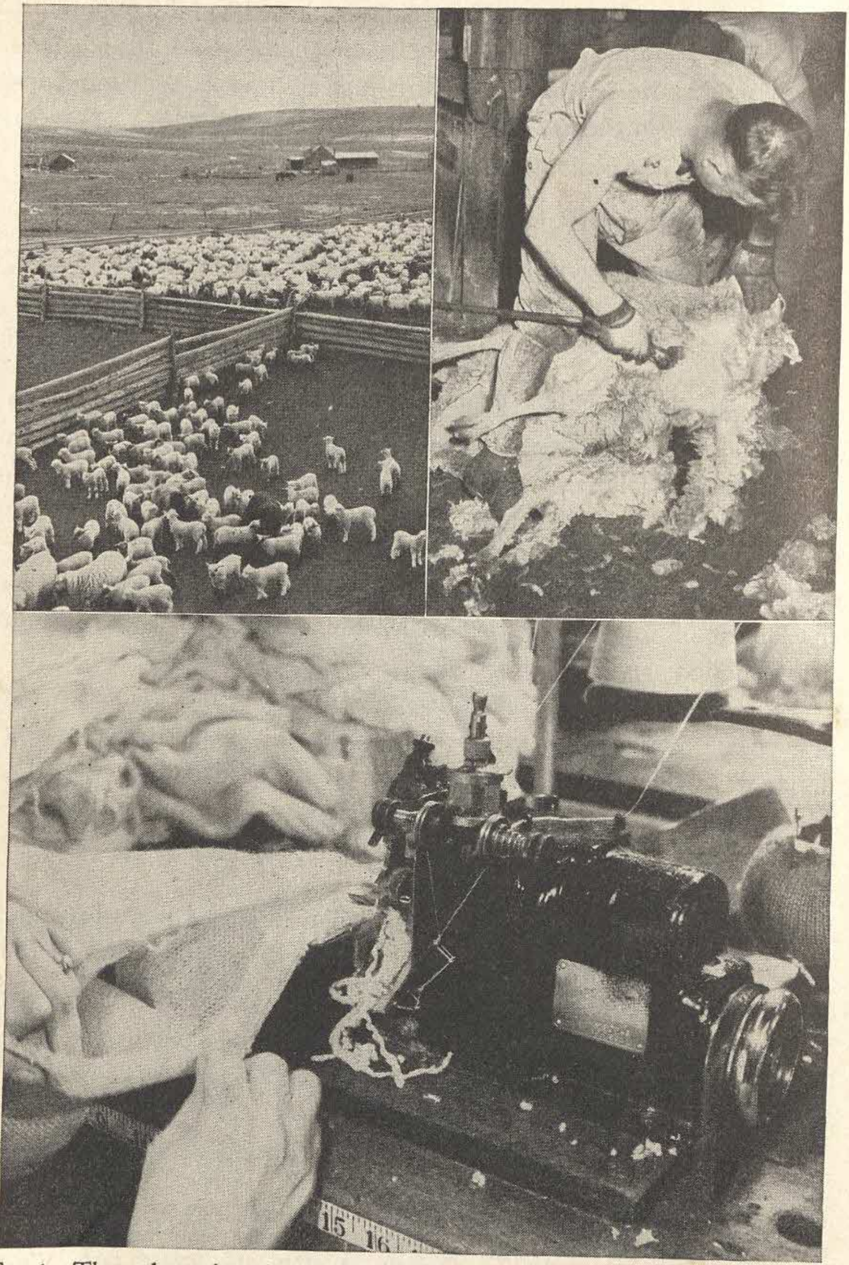

FIG. 1. Through motion pictures a process can be followed through from beginning to end. (*Encyclopaedia Britannica Films Inc.*)

dyeing; and (4) a comparison of the primitive and modern methods of spinning and weaving. Each scene sets the stage for the next step or process, and hence the continuity of the story is unbroken. Other popular films of this type are "The Wheat Farmer," "Coal," "The Romance of Steel," and "Spring on the Farm."

Unobservable motion. The motion-picture film is not limited to representation of observable action only. Many processes in nature or in industry take place too rapidly or too slowly for the human eye to detect them. Others take place in settings or situations in which they can rarely or with difficulty be seen. Through the use of the motion-picture camera these movements may be photographed and represented on the screen.

Time-lapse Photography. Unobservable motion is well illustrated in the case of plants, the growth of which cannot be detected by one watching the actual process in nature. For example, an individual may be aware of the fact that potted plants turn toward the sun and yet not actually see the movement. By placing a motion-picture camera near the plant and taking a series of pictures at intervals of 30 minutes or so, this process, which may require from several hours to several days in nature, seemingly takes place in just a few seconds when projected on the screen. In a similar manner the unfolding of a leaf, the opening of a flower bud, the growth of a young plant, the movement of tendrils or vines, and other types of plant movement may be recorded for use in the classroom. The films "The Green Plant" and "Flowers at Work" are excellent examples of time-lapse photography.

Slow-motion Photography. Not only are there many movements that take place too slowly to be detected by the human eye, but there are also many that take place too rapidly for the eye to perceive them. Here again, the motion-picture camera is indispensable. By operating the camera at a high rate of speed when taking pictures of a swiftly moving animal or object and running the finished film at a normal rate of speed, the pictures show every movement taking place very slowly, and each one can be studied in detail. Frequently one sees illustrations of slow motion in newsreels or in sport reviews. In these one sees in slow motion a few scenes of a championship boxing match, the finish of an exciting horse race, the take-off or landing of a ski jumper, a successful football play,[7] and many other situations that are made clearer to the audience when slowed up in order that each movement can be easily seen. Photography of this type is not used very extensively in the production of classroom films, but it is used, and when needed, it is very valuable. For example, in the film "The Frog" the student sees clearly the movements of the hind legs. Cameras are now available that will photograph objects moving at the speed of a rifle bullet.

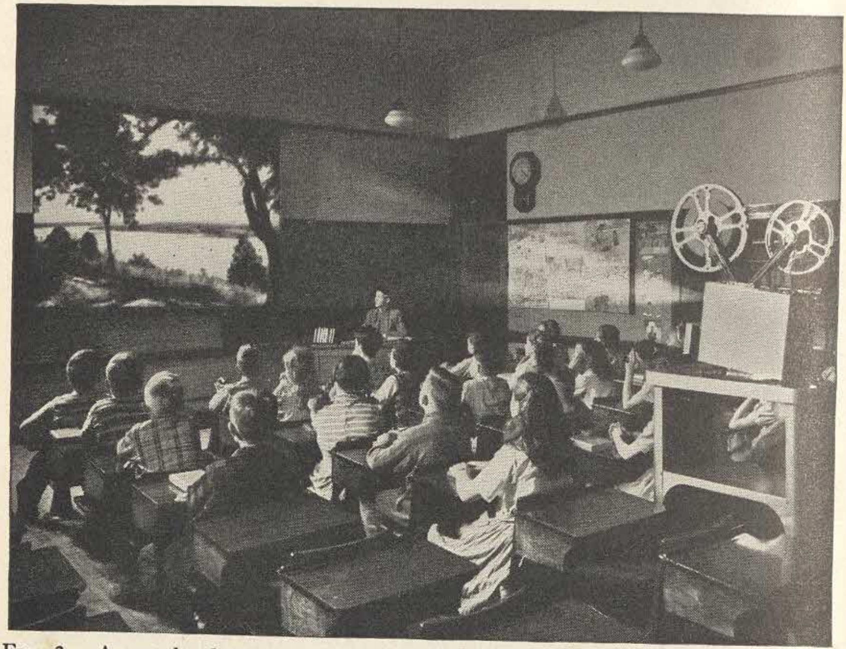

FIG. 2. A good educational setting—an interested class and clear projection. Note lightweight projector and portable projection stand. (*Victor Animatograph Corporation.*)

Microphotography. As the name suggests, in this process objects are photographed with the aid of the microscope. Tiny animals, plants, or cells too small to be seen by the unaided eye can be photographed and projected on the screen for the entire class to study them. The films "Life in a Drop of Water" and "Marvels of the Microscope" are excellent examples. Films of this type will not eliminate the microscope but will make its use more meaningful to the student.

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[7] A good illustrative article is R. E. Priebe and W. H. Burton, The Slow-motion Picture as a Coaching Device, *School Review*, vol. 47, pp. 192–198, March, 1939. "The Sports, Physical Education, and Recreation Film Guide," published by Business Screen Magazine, Chicago, includes more than 800 descriptions of motion pictures and slidefilms relating to this general field.

Miniature Photography. Just as there are objects too small to be photographed without the aid of the microscope, so there are areas too large to be included in one picture. Hence, these are set up in the laboratory in miniature form and photographed. Many of the films in the field of physical geography and geology are prepared by this method. The film "Work of Rivers" is a good example of this type of presentation.

Animation. Many classroom films now available make use of animation, which is accomplished by first preparing a series of drawings and then photographing them. Animated maps are frequently used in connection with history, science, and geography. The purpose here is to focus the attention of the student upon the area from which scenes will be presented, to call attention to the distribution of a product or population, to compare locations of cities with those of other cities in the same country or with those in other parts of the world, and so on. Animation is widely used to explain difficult or unobservable processes. For example, in the film "Refining Crude Oil" the student sees, by means of animation, exactly what processes take place in each tank, boiler, or condenser. In "Sound Waves and Their Sources" he sees how sound waves travel; and in the film "Circulation" he sees the exchanges of carbon dioxide and oxygen or the exchange of food and waste products. In such films as "Roots of Plants" and "Atomic Energy" animation helps to explain processes that cannot be presented for study in any other way.

Bringing variety to methods of instruction. Children, like grownups, usually react favorably to an occasional change in their daily procedure. The motion picture brings desirable variation from the regular instructional procedure by means of its movement, the ever-changing scenes, the brightness of the picture, and its general similarity to one of their favorite leisure occupations. In short, this variety spells attention and interest, without which there is no learning.

LIMITATIONS

Although it is now widely accepted as an excellent instructional device, the motion picture has its faults and limitations, the most important of which may be summarized briefly under the following heads: (1) cost, (2) distribution, (3) availability, and (4) misinterpretation of function. Doubtless most of these limitations will be eliminated through further study and experimentation. In fact, great progress in this direction has been made since the first edition of this book was published. In any case, if the teacher or administrator is familiar with these limitations, he can plan his use of the motion picture more effectively.

Cost. The motion-picture film is the most expensive of all visual materials. This is true whether the school owns the film or rents it. The very nature of the film is such that, even with the best of care, it will last only a few years at the most. Few schools, outside the large city systems, can afford to establish their own library of films. To meet the needs of these schools state and cooperative libraries have been established. Even with these libraries the expense is relatively high.

On the other hand, this cost may not be so great if one considers the relative effectiveness of teaching with films and teaching by traditional methods. The motion picture presents a wealth of material, presents it most attractively, thus reducing failures, repeats, and disciplinary troubles, and presents it to any size group, thus lowering per-pupil costs. In the long run film expense may in reality be very reasonable.

Distribution. Whether the school maintains its own library or depends upon some outside source for its films, the problem of having the film at the time needed remains the same. Any plan based upon the requisition of films several weeks in advance can obviously never be entirely satisfactory.

However, many public libraries are now lending films on the same basis as books, except for a shorter period and a rental fee. This definite trend means a supplementation of service of the large central film library. This plan is helping to lessen the difficulties of distribution.

Availability. After the film has been delivered to the school, it should be in the hands of the instructor in time for him to preview it and make definite plans for its use. The shortage of projectors may handicap this previewing. Then again, without an extra charge few libraries allow the school to keep the film for a period long enough to get the maximum value from it.

But there are indications of improvement. Many film libraries are now offering reduced rates where the film is used for a period of a week or more. With better previewing facilities the longer period of rental should help in overcoming this limitation.

Misinterpretation of function. The very characteristics of the motion-picture film that make it well suited for entertainment purposes also make it one of the most forceful instructional aids. Unfortunately, however, many teachers still consider the film primarily as a means of entertainment rather than as a potentially integral part of their teaching procedure.

Nearly all teacher training institutions are offering courses or sections of courses in audio-visual work. Some are helping with the in-service training program by conducting extension classes and short workshops. This training program should, within a few years, help the teachers, both prospective and those in service, to see the motion-picture film in its full relationship to all other materials of instruction. The resultant attitude will decrease the influence of this misinterpretation-of-function limitation.

Operation of projector. To get the maximum value from the motion picture the teacher must be able to operate the machine. Motion picture projectors are not difficult to operate. As long as teachers are permitted to fear this operation and as long as they are not given an opportunity to learn, the effective use of this valuable tool will continue to be handicapped.

In many schools teachers are encouraged to attend classes conducted by the audio-visual director. The major emphasis of these courses is on the handling and operation of equipment. A few schools give professional or eligibility credit toward promotion or salary increases for this work. This plan of instruction is helping to eliminate a weakness that has always plagued school use of motion pictures.

Lack of suitable facilities. In order to make its maximum contribution the motion picture must be correlated with all other instructional materials. This means that the film should be shown in the classroom. To date very few schools have facilities for darkening all classrooms.

There are three current developments that are strengthening this weakness: (1) the practice of equipping one room in order that all classes using motion pictures can have access to it when needed, (2) lighter projectors, which can be easily carried from room to room, and (3) brighter illumination, which gives satisfactory results in a semidarkened room.

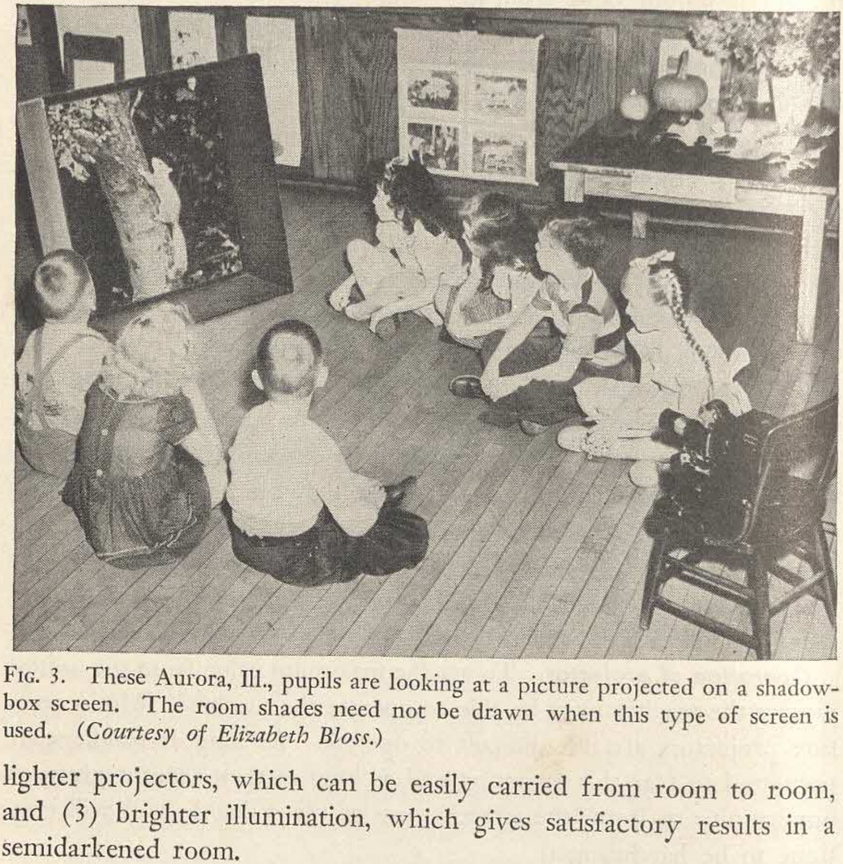

FIG. 3. These Aurora, Ill., pupils are looking at a picture projected on a shadow-box screen. The room shades need not be drawn when this type of screen is used. (*Courtesy of Elizabeth Bloss.*)

EDUCATIONAL VALUES OF MOTION PICTURES

By 1920 people began to realize that the "movie" was exerting a great influence on society. To determine the extent of this influence a study was financed by a grant made by the Payne Fund. The conclusions that came out of this investigation (1929, 1933) are (1) the motion picture is a great factor in education; (2) the child gains a great many facts from the motion picture, and he remembers these facts for a long period of time;[8] (3) attitudes toward social problems are changed immeasurably by the motion picture; (4) motion pictures arouse the emotions, and (5) they exert a powerful influence on patterns of conduct.[9] The following four established values help to explain these influences: [10]

A more realistic learning situation. Most of the changes that have been made in methods of instruction during the twentieth century have been brought about in an effort to make the situation in the classroom more real or lifelike.

The ideal method of learning how coal is produced, how corn is harvested, or how a tractor is assembled is to visit a mine, a farm, or a factory and obtain firsthand information. However, this is not always possible. It is possible to bring into the classroom by means of the motion picture a very realistic substitute for this field study. Through the film the conditions under which the miner works, the equipment needed to harvest corn, the innumerable parts that go into a tractor, as well as the procedures involved, become very real to the students.

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[8] In his summary of the Payne Fund Studies, W. W. Charters ("Motion Pictures and Youth; a Summary," pp. 8–10, The Macmillan Company, New York, 1933) points out the extent to which children acquire facts from motion pictures in these words: "If parents take their eight-year-old child to the movies, he will catch three out of every five items that his parents catch. In general, the second- and third-grade children at the end of six weeks remember 90 per cent of what they knew on the day following the show. Three months after seeing a picture they remember as much as they did six weeks after seeing it. Of interest is an implication that very young children remember correctly 50 per cent to 60 per cent of what they see. . . . Children of all ages tend to accept as authentic what they see in the movies." These statements are based on the study by P. W. Holaday and George D. Stoddard, "Getting Ideas from the Movies," The Macmillan Company, New York, 1933. See also H. J. Forman, "Our Movie-made Children," and R. C. Peterson and L. R. Thurston, "Motion Pictures and the Social Attitudes of Children," both published by The Macmillan Company, New York, 1933.

[9] An excellent pro-and-con article on the movies is, Are the Movies a Menace? by Ezra Goodman, *Coronet*, vol. 24, pp. 36–50, July, 1948. This investigative article classifies and competently weighs the numerous charges against the motion picture industry.

[10] Most of the values of both nonprojected and projected still pictures, suggested on pp. 137, 188, are equally applicable to the motion picture. Articles that emphasize nonfactual values are L. L. Ramseyer, Measuring the "Intangible" Effects of Motion Pictures, *Educational Screen*, vol. 18, pp. 237–238, November, 1939, and the seven articles to be found in Some Educational Aspects of Motion Pictures, the January, 1940, number of the *Journal of Educational Sociology*.

Greater factual retention. Exhaustive tests have definitely proved that students usually remember materials presented by the film much longer than they remember those presented by the text. This period of longer retention is in part due to the fact that while the film is being shown, it holds the undivided attention of the student, something that a book never does. Further, it is also due to the fact that the material is presented more clearly to the student—he sees the actual item instead of the symbols used to represent it. For example, the word "combine" is almost meaningless to the student reading about wheat production if he has never seen such a machine. It is something very meaningful to him if he has seen the film "The Wheat Farmer."

Economy of time. During the past fifteen or twenty years the writer has asked his students to write a paper on why they liked the motion picture as a part of the instructional program. Almost every one of them designated it as a timesaver, and many of them proved this point with personal illustrations. In some cases, in controlled experiments, students instructed through the motion-picture film acquired facts in less than one-fourth of the time required by those who learned the same material from reading and oral discussion. When one considers the numerous courses that have been added to the curriculum and the extent to which all subject fields have been enriched, the significance of this speeding-up of the learning process becomes evident. Apparently this value alone is sufficient to justify the use of the motion picture.

Special aid to the slow reader. A student is a slow reader usually because of defective eye movement, poor reading techniques, vocabulary difficulties, or because he is mentally retarded, emotionally disturbed, or lacks sufficient background with which to interpret what he reads. Many of these difficulties are eliminated when he studies a film.

When viewing the film, the eye takes in the whole image. Usually the item is identified as it is shown on the screen. Hence, the word whether spoken or printed is closely associated with the item and becomes meaningful. For example, in the film "Flowers at Work" the child hears or sees the word "anther" as this part of the flower is pointed out. Thus he not only sees this part of the flower and learns its name, but he also learns its function.

One should not infer from the above that the slow reader or the retarded pupil will get as much from the film as the better reader or the pupil with a higher I.Q. Naturally, as was pointed out before, the latter will acquire more from the film because he has a better background for understanding and appreciating its content and is more capable mentally. However, the slower pupil can profit greatly from viewing a film, certainly more than from reading a book.

THE SCOPE OF THE EDUCATIONAL FILM

The term "educational" is applied to films produced primarily for instructional purposes to distinguish them from the theatrical motion pictures made exclusively for entertainment. It is impossible to draw a sharp line of distinction between these two types of film because some of the theatrical productions, such as "Mark Twain," "Woodrow Wilson," "Gone With the Wind," "Madame Curie," and "How Green Was My Valley," are highly instructional as well as entertaining.

Educational films may be divided into six groups: (1) classroom films, (2) industrial films, (3) school-made films, (4) documentary films, (5) newsreels, and (6) photoplays. A brief description of each of these types will indicate its possibilities. At the present time the most suitable films are found in the first group.

Classroom films. These films are made for use in connection with the development of certain units or topics of schoolwork. They are prepared by individuals who are familiar with the needs of the school. The great majority of classroom films may be classified under one of the following headings: (1) films explaining a process; (2) films giving information; (3) films demonstrating a skill; and (4) films dramatizing an event, episode, or the life of an individual.[11]

Process Films. Many processes in nature, in industry, and in other fields can be explained very clearly by the motion picture. For example, in the film "Digestion" one can trace the changes in the food from the time it is taken into the mouth until it is absorbed into the blood stream, a process that is very complex but one that is very clearly shown. The film "Atomic Energy" sets forth the basic principles used in harnessing the power of the atom. "How a Bill Becomes a Law" shows where the bill originates and the procedure through which it goes before becoming a law. "Making Money" attractively explains a process of interest to all.

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[11] These classifications are not mutually exclusive. Obviously, under certain circumstances probably all films could be classified as informational. Some of the films dramatizing an event, episode, or the life of an individual could be classified as documentary or newsreel. However, for the purpose of showing the main emphases of the various types of films, this classification is satisfactory.

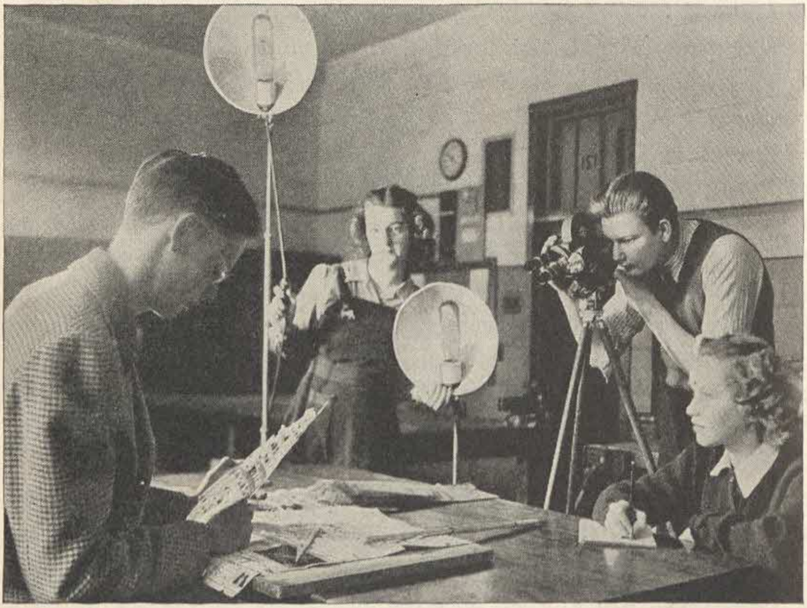

FIG. 4. New, interesting, and creative work enhances both educational and recreational activities. These students are making a movie on the construction of model airplanes. (*Bell & Howell.*)

Films of General Information. This classification includes literally hundreds of titles, which may be grouped under one of the following headings, those (1) depicting natural events, (2) showing life and conditions in other lands, (3) presenting life and conditions of other periods, and (4) giving information concerning the occupations and industries of the world.

These films are excellent for providing specific information on a given topic or unit and for building a background of understanding and appreciation of many everyday things. They also give a better understanding of the conditions and events in other countries.

Natural Events. Nature is a subject of interest to everyone, and there are many natural events that can be photographed and presented in a very interesting and informative manner. For example, the film "Plant Growth" shows in detail the process of growth from the bursting of the seed coat by the embryo to the dispersal of the seed by the mature plant. "Seed Dispersal" shows the adaptations of several different plants for distributing their seeds. "Common Animals of the Woods," "Birds of the Countryside" and many others of a similar nature are produced in color.

Life in Other Lands. For years teachers of geography have been searching for some way to make Yellowstone Park, Denmark, or Brazil mean more than a brightly colored area on a map. The motion picture is well suited to this purpose. By means of it the Everglades of Florida, the lumber regions of the Pacific Northwest, the wheat ranches of the Great Plains, the communistic farms of Russia, and the oases of the Sahara are, or can be, made almost as meaningful to the child as his immediate environment.

Life and Conditions of Other Periods. These films are designed to give a better understanding and appreciation of life and conditions in earlier periods of history and to relate this information to the present and the future. The progress that has been made in the last few years can hardly be appreciated unless one can go back and visualize life as it was in those earlier times. The experience of the average student with this material is limited. His experience may be enriched by the use of such films as "Planter of Colonial Virginia," "Eighteenth Century Life in Williamsburg, Virginia," "The Gay Nineties," "Kentucky Pioneers," and "The Flatboatmen." Further, such films as "Thomas Jefferson of Monticello" and "The Declaration of Independence" show him the contributions of many of the nation's great leaders. Incidentally, in preparing these films extreme care is used to ensure that all materials, methods, costumes, buildings, and so on, accurately represent those of the period pictured.

Occupations and Industries of the World. Today, students are asked to think in terms of world cooperation and world peace. It is impossible for the students to think on an international plane unless they have some information about the people of other lands, their occupations, industries, standards of living, and so on. For this purpose the motion picture is unexcelled.

The following films are typical of the numerous titles available on foreign countries: "Historic Switzerland: The Rhone Valley" presents both the ancient and modern history of the famed mountain republic and shows the people at work in the shops and on the farms. "The Wind from the West" is an interesting film depicting the traditions, costumes, habits, and mode of living of the Lapps of northern Sweden. "Peoples of the Soviet Union," "Rural Life in Mexico," "Canada, World Trader," and "China" are other examples of the numerous films that have been produced to acquaint the people of the world with their neighbors and their work.

Demonstrating a Skill. This type of film has one outstanding advantage over the actual observation of the skill pictured—a large group can see every step and detail of the procedure on the screen whereas only a few can witness the demonstration. Films for teaching skills proved their worth during the war; they were widely used in instructing workers in the factory as well as men and women in the armed services. Such films are used extensively in teaching modern surgery for the reason mentioned above and also because they can be reshown as often as they are needed. In this instruction they are superior to watching the actual operation. "Advanced Typing Shortcuts," "Cutting Keyways," and "Elementary Operations on the Engine Lathe" are suggestive of the films available for teaching skills.

Dramatizing an Event, an Episode, or the Life of an Individual. The series of films, The Yale Chronicles, represented the first attempt to tell the history of the United States dramatically by means of motion pictures. In this series "Wolfe and Montcalm" and "The Declaration of Independence" are examples of films centering around an event. In the former, situations in Europe responsible for the war helped to lead into and develop the main theme, which centers about Wolfe's daring attack on Quebec and Montcalm's heroic defense of the city. The film "Dixie" is another excellent example of dramatization. In it one sees the life of the Southern civilian portrayed from the time the men leave for war until General Lee's surrender. "The Pilgrims," "The Puritans," and "The Eve of the Revolution" are other titles from the same series. Unfortunately, these are silent films, but they do give a wealth of information on the history of the United States from the Colonial period to the close of the Civil War.

There are also several excellent films released by Teaching Films Custodians. Many of them are in color. "Give Me Liberty" dramatizes the conditions leading to, and the presentation of, Patrick Henry's famous oration "Give Me Liberty, or Give Me Death." "The Declaration of Independence," "The Song of Our Nation," and "The Monroe Doctrine" are others from this series. These films are highly dramatic. The student who sees the film "Song of Our Nation" cannot help but feel a greater reverence for the national anthem.

There are also many films based upon the life story of outstanding leaders of the world. These films trace the life of the individual and show his contributions to the nation or the world. "Columbus," "Alexander Hamilton," "Louis Pasteur," "William Penn," "Franklin D. Roosevelt," "Abraham Lincoln," "Thomas Edison," and "Elias Howe" are illustrative of these biographical films.

The sponsored film. Many industrial organizations have produced films to advertise their products or services. These films are loaned free except for transportation charges. Although the films that were first produced contained a great deal of blatant and objectionable advertising, the newer ones have eliminated this, most of them identifying the company responsible only on the title scene. Many of these sponsored films are in color and are excellent in photographic quality. As a general rule, they are longer than the average classroom film. Some of these films are now accompanied by study guides and outlines.

The use of the sponsored film in the school has been the subject of many an argument.[12] One finds both extremes in its use; in some schools the sponsored film is banned, and in others it is used almost exclusively. Many schools schedule it for general assembly and noon entertainment but not for instructional purposes, strictly speaking. It is not the purpose of the authors to debate the question of using sponsored films but rather to call attention to the fact that they are available. In any case, the sponsored film should certainly be previewed before it is used.

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[12] The pro and con views of this type of motion picture are set forth in O. A. Engstrom, What's Wrong with Sponsored Films? and B. A. Aughinbaugh, Plenty Is Wrong with Sponsored Films, *Clearing House*, November, 1946, and January, 1947. Another pertinent evaluative description of sponsored films will be found in the Educational News and Editorial Comment section of *School Review*, vol. LIV, pp. 126–130, March, 1946.

"Eighteenth Century Life in Williamsburg, Virginia" shows the family life and work of a cabinetmaker of the Colonial capital of Virginia.[13] "This Amazing America," "Unfinished Rainbows," "Romance of Steel," and "Appleland" are other illustrative films in this group.[14]

School-produced motion pictures. Many schools have produced films of their own reflecting homecoming, outdoor pageants and programs, school trips and tours, football and other sports, as well as certain types of curricular events and activities. A few schools have even produced films for instructional purposes.[15] These school-produced films are being increasingly used by administrators for publicity purposes. Naturally, such a motion picture is always interesting to a community because it concerns "our children and our schools."

Because production can be extended over a considerable period of time and can enlist the cooperation of several departments, the production of a school film may represent an excellent project for the students; on the other hand, it may not represent a worth-while project. Although amateur writers, directors, and photographers should not be expected to rival the work of professionals, they should produce a film whose quality justifies the time and money invested in it. Studying several motion pictures from the standpoint of acting, direction, photography, and editing, and "shooting" a few scenes experimentally should give the group some little experience. A suitable camera is, of course, essential.[16] However, because film is expensive, and picture production is a highly developed and specialized art, unless the person in charge has had considerable experience in such work, outside expert help should be employed.[17]

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[13] For a further description of the content of this film see the lesson plan based upon it, pp. 481–488.

[14] The most complete volume on industrial films and their sources is "The Educators' Guide to Free Films" published annually by the Educators' Progressive Service, Randolph, Wis.

[15] For the last three years the American Museum of Natural History, New York, has awarded an "Oscar" for school-made films. This competition is open to all students of junior and senior high schools who submit an entry blank through their faculty adviser by May 15. Films are judged on the basis of (1) purpose and extent to which it is achieved, (2) photography—composition, lighting, and focusing, (3) story—central theme, continuity, titling, direction, imagination, and (4) narration or commentary, sound effects. The 1947 award went to "Reaction in Frogs," a production of the Motion Picture Club of Evander Childs High School, New York.

[16] A good article on equipment is D. Schneider, Your Guide to Camera Buying, *Educational Screen,* vol. 26, pp. 323–326, June, 1947. The "minimum" equip-

The documentary film. This type of motion picture was used extensively during the war to make the civilian or the service man realize the importance of his work and to see his job in its relationship to the war effort. Somewhat like a newsreel it may deal with the daily life of the people of a given geographical area or in a specific industry, but it goes beyond the newsreel in that it interprets the story with power and force. Often it deals with questions of vital importance to society and sometimes with highly controversial matters that may not be suited to the public school classroom.

One of the earliest documentary films was "Nanook of the North" produced in 1919 by Robert Flaherty, who photographed the Eskimos as they went about their daily work in the Hudson Bay region. It showed their struggle for food, shelter, and the other necessities of life. Some of the leading documentary films of the present day are "The Plow That Broke the Plains," "The River," "The City," "Song of Ceylon," "Today We Live," "Neighbors Under Fire," "Fish is Food," "Conquering Darkness" and "The Mexican Story."

The newsreel. Another type of film that has recently been made available for school use and that has a definite place in the instructional program is that illustrated by the March of Time series. Because the content of these films concerns recent events, both at home and abroad, they fit easily into social-science courses.

One possible hindrance to the school use of the newsreel is that it is always "late"—it is not issued on 16-mm. stock until after it has been released to the theaters. Of course, this would not be an objection to the summary reels. It may not be a serious objection to the weekly issues because most of the material included is still accurate and pertinent several weeks or even months later. When used to illustrate or supplement some topics or units, recency may not even be necessary.

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ment necessary, together with estimated costs, is described by Neal Keehn and Leonard Keck in A Basic 16-mm. Motion Picture Production Unit for Schools, *See & Hear*, vol. 3, pp. 28–29, April, 1948.

[17] See the list of references on pp. 244–245. Since February, 1940, *Educational Screen* has included a department called "School-made Motion Pictures."

The photoplay. Many of the well-known classics are now available on 16-mm. films, some of them in color. A few of the best known photoplays now available for school use are "Treasure Island," "Tale of Two Cities," "As You Like It," "Adventures of Tom Sawyer," and "Caesar and Cleopatra." The rental on these films is rather high; consequently, few schools can afford to use them as a part of the classroom instructional program. However, they can be used to an advantage with large groups or for assemblies. Perhaps, in time, if the expense can be reduced, this type of film will be used more widely.

SPECIAL USES OF MOTION PICTURES

Motion pictures may be used advantageously in a number of settings and situations outside the classroom. The following will illustrate some of the possibilities.

In vocational guidance. Irrespective of whether the guidance activities of the school are carried on formally as regular courses or more informally as a part of home-room, club, assembly, and other activities, the motion picture should be found valuable in connection with them. Nearly all of the newer industrial films are quite appropriate for this type of instruction. However, the value of the film will depend upon the manner in which it is used. Simply to show the film is not enough. Its presentation must be carefully planned, with opportunities provided for discussion both preceding and following. In many instances, as a follow-up activity the students might visit a local plant or listen to a talk by a personnel director.

Good vocational films give pertinent information on the following: (1) training required for a particular job or profession; (2) necessary personal qualities; (3) types of work or study involved; (4) training required; (5) social importance of the occupation or profession, and (6) opportunities in the particular vocation.

Guidance films are now available in the following areas: (1) personality traits, (2) social skills, and (3) occupations.[18] A few illustrative titles are: "Choosing Your Vocation," "I Want a Job," "Junior Prom," "You and Your Family," "Automotive Service," "The Electrician," "Men of Medicine," and "Radio and Television."

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[18] In a recent survey of the guidance program of 252 educational institutions it was found that 90 were making extensive use of audio-visual materials. For further details on this study see A Survey of Visual Materials Used in Vocational Guidance by Gordon H. Finn, *Educational Screen,* vol. 27, pp. 72–73, 80, February, 1948.

In extracurricular activities. Motion pictures are used effectively in the instruction of athletics in baseball, football, basketball, hockey, swimming, track events, and so on. They are also used in connection with gymnastic exhibitions, drills, and marching, as well as in various kinds of club, music, dramatic, and other activity. As suggested previously, this general field offers many excellent opportunities for the production of school-made films.

In giving publicity to school activities. Increasingly, school administrators are planning and developing motion pictures reflecting the events, activities, procedures, and interests of the local schools and bringing these to the attention of parents and patrons through the Parent-Teachers Association, graduation programs, and other school-sponsored meetings, as well as through similar meetings of civic and religious organizations and local clubs.[19]

In financing the audio-visual program and other school activities. Provision for audio-visual and extracurricular materials and equipment should be made in the regular school budget because these represent instructional devices. In some communities, however, the board is reluctant to budget such expense, either because the members do not see the values to be derived or because such budgeting is not a traditional part of school policy. In such situations it may be necessary to use motion pictures during the noon hour and free periods, as well as at night, to acquaint the public with the audio-visual program or to finance it or certain extracurricular activities. There are many full-length Hollywood features available for this use.

In encouraging intelligent motion-picture consumption. Because the average individual will consume motion pictures nearly all of his life, it is logical that some attention should be devoted to the problem of making this consumption as profitable as possible to the consumer. The school is the proper place to provide this instruction because it enrolls all of these future consumers. Teaching discrimination in motion-picture consumption can be done in the same way that any other type of discrimination is taught—by discovering what the pupils like and why they like it and by critically examining these reasons. Naturally, this program of the improvement of pupil tastes in motion pictures should not be of a high-pressure, authoritative, "now-if-you-don't-like-this-you're-a-low-brow" type (commonly found in similar programs of music, literature, and art "appreciation"), but a sympathetic reasoning type of approach. In this a free and frank pupil discussion is basic.[20]

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[19] Digests of a a number of articles showing how local schools produced motion pictures and used them in public-relations activities will be found in Dale, Dunn, Hoban, and Schneider, "Motion Pictures in Education," pp. 279–285, The H. W. Wilson Company, New York, 1938. See also J. H. Hull, Show the Public—Through Movies, *School Executive*, vol. 58, p. 16, 1939, and W. S. Wagner, School-made Motion Pictures for Public Relations in Ohio, *Educational Screen*, vol. 19, January, February, and March, 1940.

In adult education. The motion picture is of special value in the rapidly developing field of adult education. The film provides numerous ideas or problems for discussion. This group discussion will be all the more interesting if carefully worded specific questions are handed out to the members before the screening of the film. Suitable films are now available for almost any subject. However, a film should be carefully and critically previewed before it is shown to the group. It can be correlated with other instructional materials such as books, charts, maps, and slides, or it can be used alone.

In promoting international understanding. Failure to maintain the peace following the First World War and the tragic lessons of the Second World War should be sufficient to emphasize the need for better international understanding. There are new weapons of war—the atomic bomb, radio-guided missiles, jet-propelled planes, radar, and so on—to be understood. At least as important is the correlative need of understanding the ways through which these and other weapons of destruction can be relegated permanently to the trash pile. The school must assume its responsibility in building for world peace by educating future citizens to appreciate the huge costs and the uselessness of war.[21] Some of the films that have been prepared to assist in promoting world peace are "Now the Peace," "The Peoples' Charter," "Atomic Power," "One World or None," "Boundary Lines," "Our Shrinking World," and "The Peace Builders."

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[20] Motion-picture evaluation is a regular unit of instruction in the San Jose, Calif., junior high schools.

Five pertinent references are J. N. Busch, Motion Picture Appreciation in the Junior High School, *High Points*, vol. 20, pp. 44–48, September, 1938; E. Dale, A Comprehensive Program for the Teaching of Motion Picture Appreciation, *Educational Screen*, vol. 13, pp. 125–128, May, 1934; K. Pease, Hampden's Course in Appreciation of Movies and Radio, *Clearing House*, vol. 12, pp. 39–43, September, 1937; G. W. Rasmussen, Our Motion-picture Enjoyment Club, *School Activities*, vol. 11, p. 163, December, 1939; and L. C. Spires, The Movie Club as a Visual-education Project, *Educational Screen*, vol. 16, pp. 285–286, November, 1937.

TEACHING WITH THE MOTION-PICTURE FILM

Even though the value of the motion picture as an instructional tool has been widely accepted, it is also true that this audio-visual aid has probably been misused more than any other. The main reasons for this misuse are (1) the newness of the film as a teaching aid and a consequent lack of suitable experience with it and (2) unjustifiable attitudes on the part of administrators and teachers. Although administrators can encourage a more intelligent use of the motion picture by making appropriate administrative provision, in the last analysis the teacher must accept responsibility for making this intelligent use.

Perhaps there are a few motion-picture-minded teachers who need relatively little training in the proper use of the film. The great majority of teachers do need this training, however, especially those who appear to think that the only procedure necessary is to show the film and that the pupil will automatically absorb all the information it contains. It should be remembered that the child has seen many motion pictures in his leisure hours, and there is always a danger that he will consider the school film as entertainment. In fact, he will unless he is taught to see and appreciate it as a teaching device. His natural interest in motion pictures must be exploited for instructional purposes, and the teacher is the only person who can help him to develop the proper attitude. The following suggestions should enable the teacher to plan a more effective procedure when using a film.[22]

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[21] Lists of suitable films may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. (an annotated list of nearly 1,400 government films), "Films for International Understanding," Educational Film Library Association, and Films of the Nations, Inc. A pertinent article, which also lists several kinds of appropriate audio-visual aids, is E. L. Berg, Visual Aids on United Nations, *Educational Screen,* vol. 24, pp. 22–23, January, 1946. The Film and International Understanding is a regular department of *Educational Screen.*

Setting up specific objectives. A teacher would hardly consider using a map, a chart, a model, a specimen, or a similar teaching aid without having in mind specific reasons for its use. Likewise, she should have certain formulated objectives before using the film, and as in all good teaching, she should acquaint her students with these educational objectives. Usually there should be two sets of objectives—the general over-all outcomes and the specific information to be gained from each screening of the film. For example, in using the film "The Southeastern States" the general objectives might be as follows:

1. To give the students a better understanding and appreciation of the states comprising this area
2. To acquaint the students with the products of this section
3. To give the students some information on the basic social problems in this area
4. To acquaint the students with some of the outstanding leaders of the Southland, and so on

During the first screening of the film the instructor might ask the students to note only such things as the following:

1. The name of each state in this area
2. The various farming regions and the length of the growing season in each
3. The products of each farming area

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[22] A very pertinent and helpful little booklet by C. R. Crakes, "Suggestions for Effective Techniques of Utilizing Motion Pictures in the Classroom" (1948), may be obtained free from the DeVry Corporation, Chicago. John E. Hansen's article, A Study of the Comparative Effectiveness of Three Methods of Using Motion Pictures in Teaching (*Educational Screen*, vol. 19, February and March, 1940), is pertinent to this discussion. Chapter II of this article briefly reviews previous investigations in the educational use of motion pictures.

"Instructional Films—The New Way to Greater Education" is the title of a two-and-one-half-reel sound picture that shows the values of motion pictures in classroom work and makes definite suggestions for the best utilization of them. This picture is loaned without charge by Coronet Instructional Films. Another excellent motion picture designed for instructional purposes is "Using the Classroom Film," Encyclopaedia Britannica Films Inc. See also the references on pp. 69–70 and Chaps. 14–18 of this book.

The second screening might call for more specific information, such as:

1. The products that are shipped to other areas
2. The items for which these products are exchanged
3. The race problem, and so on

Thus, after establishing specific objectives, the teacher must plan the presentation procedures that will ensure the attainment of these. In no other way can satisfactory results be obtained.

Adapting the film to a particular grade level. Nearly all films are prepared for use at a specified grade level. Often they are not used at this level, however. Some producers have been surprised to find that their primary science films were being used very extensively in the upper grades and in the high school. Therefore, before presenting a film to the class, the instructor should preview it, study the manual, and note the words that will need to be defined, the scenes that will require additional explanation, and any other parts that may need clarification. Any such teacher-preparation will pay high dividends in pupil response.

Determining the place of the film in the unit or lesson. The proper place to use the film is also a factor that must be considered. It may be that the film can make its greatest contribution at the beginning, in introducing a topic or unit. Some films, such as "Atomic Energy," are of such a technical nature that they can be used to better advantage after the students have studied the text. In other situations the film can be used to review or summarize a unit. The location of the single "best" place for using a film cannot be arbitrarily stated because it will depend upon many elements of the setting. The instructor herself will have to determine this placement.

Preparing the students to view the film. As stated above, most students still look upon the film as a means of entertainment rather than as a medium for instruction. The teacher will have to plan her lessons very carefully in order to overcome this attitude. Reading assignments, reports, laboratory work, field trips, radio programs, the study of flat pictures and slides, and so on—all have a place, depending on the purpose and content of the film. These are recognized educational devices, and when used in connection with the motion picture, they not only help to clarify the particular lesson but also to correct

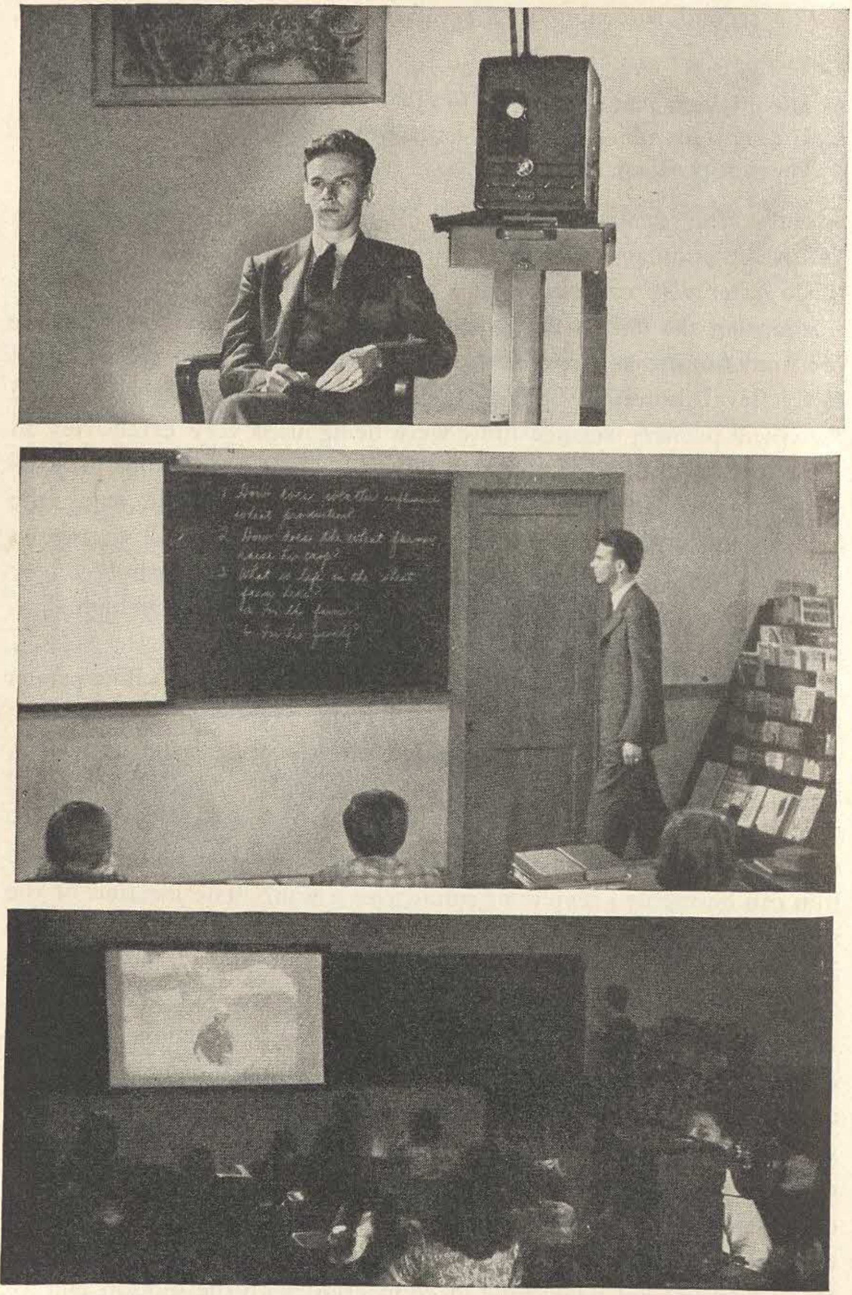
1. How does weather influence wheat production
2. How does the wheat farmer raise his crop?
3. What is left in the wheat farm bin?
a. For the farmer
b. For the family?

FIG. 5. The essential steps in the utilization of a classroom motion picture are shown in these illustrations: 1. Previewing the film; 2. Preparing the class for

the film; 3. Showing the film; 4. Discussing the film; and 5. Correlating the film with other instructional aids. (*Encyclopaedia Britannica Films Inc.*)

the film-entertainment misconception. Although the students should make some preparation, the instructor should not overlook the fact that it is possible for them to "overprepare," that is, to work so much with these other devices that, when shown, the film adds little or nothing to the lesson.

Presenting the film. It is as reasonable to expect the teacher to know the content of a film as it is to expect her to know any other content material before presenting it to the class. However, sad to relate, this is not always the case, mostly because previewing facilities are still very inadequate. Even if it is impossible for her to preview the film, the teacher can usually get a fairly good picture of its content and presentation from the study guide accompanying it.

After familiarizing herself with the film content, the instructor should plan her method of presenting the film. The following questions are pertinent:

1. What words or terms will need to be defined?
2. What scenes will need some explanation?
3. How many times should the film be shown?
4. What information should the student be expected to obtain from the first screening, the second, the third, and so on?
5. What areas of the film will require further study?
6. What scenes are most likely to be misinterpreted?

After the screening of the film the students should be given an opportunity to discuss it. In this manner many misconceptions can be corrected immediately.[23]

The instructor will find that her actual experience in using films will be of immense value in assisting her to present them to the students most interestingly and effectively.

Planning the follow-up activities. A film presentation that does not arouse interest that can be directed into further learning activities is either not a good teaching film or not a good presentation. Any of the procedures suggested for preparing the class to view the film can be used to develop and round out its content. Written summaries or reports, scrapbooks, experiments, field trips, additional reading—all grow easily out of the film and can be used for this follow-up purpose.

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[23] For an interesting report on the various methods of presenting films and the effectiveness of each method see "Audio-Visual Paths to Learning" by W. A. Wittich and J. G. Fowlkes, Harper & Brothers, New York, 1946.

Evaluation in terms of pupil growth. The acid test of the film is its contribution to the child's ideals, knowledge, and habits. Tests of both the subjective and objective type can be used to determine its contribution. The results of pretests compared with those of other tests given after the final showing of the film will be helpful in evaluating it. The reaction of the students in the follow-up activities is indicative of the value of the film as a teaching aid. General pupil opinions will also be valuable. It is safe to assume that the contribution that the film makes is in direct proportion to the planning of the teacher and the preparation of the pupils.[24]

[24] Chapter 3 of "Focus on Learning," by C. F. Hoban, Jr. (see p. 243) is entitled Student Reactions. Another pertinent reference by this author is Film Evaluation in Practice, *Educational Screen*, vol. 27, pp. 63–65, 71, February, 1948. See also H. A. Gray, Pupil Evaluation of Sound Film Components, *Elementary School Journal*, vol. 40, pp. 507–517, March, 1940; Donald Ingli, What Parents, Teachers and Pupils Think About Visual Education, *See & Hear*, vol. 3, pp. 15, 38–39, October, 1947; H. J. Queen, From the Children, *See & Hear*, vol. 1, pp. 22–25, December, 1945; and F. E. Taylor, Educational Motion Pictures Evaluated by Children, *Education*, vol. 61, pp. 346–368, February, 1941. See also the footnote reference to evaluative devices, pp. 230–231.

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THE MOTION PICTURE

II: SELECTION AND CARE OF MATERIALS AND EQUIPMENT

Motion-picture films and projectors are expensive and, consequently, should be selected carefully, utilized wisely, and maintained properly, not only because of the money invested in them but also because of the necessity for instructional efficiency. An inappropriate or mutilated film or an unsuitable or broken projector can never be a satisfactory teaching instrument. Delays caused by negligent use will always be detrimental. Two good general rules are (1) do not rent or buy in a hurry and (2) keep all materials and equipment in first-class condition.

SIZES AND TYPES OF FILM

Sizes of film. The 16-mm. motion-picture film, so-named because it is 16 millimeters in width, has come to be accepted as the standard for schools. It should not be confused with the 35-mm. film, which is the standard size for theaters. This word of caution is mentioned here because some catalogues list films in both 16-mm. and 35-mm. sizes.

The 8-mm. film, one-half the width of the 16-mm., is now receiving considerable attention. It is most widely used for the production of home movies. It costs only about one-fourth as much as a similar footage of 16-mm. There are now many good classroom films available on 8-mm. stock, and because an 8-mm. reel can be bought for a dollar or so more than the rental price of a 16-mm. film, companies may make it possible for more schools to own films by making them available in this size.

The silent film. Volumes have been written about the superiority or the shortcomings of the silent film as compared to the sound film. One advantage of the silent film, whether rented or bought, is that it costs only half as much as the sound film. A second advantage is that it is possible to adapt a silent film to various grade levels and numerous subject areas because the teacher provides the narration for it. When teachers are more accustomed to using motion-picture films in the classroom, they will be better prepared to utilize the silent film.

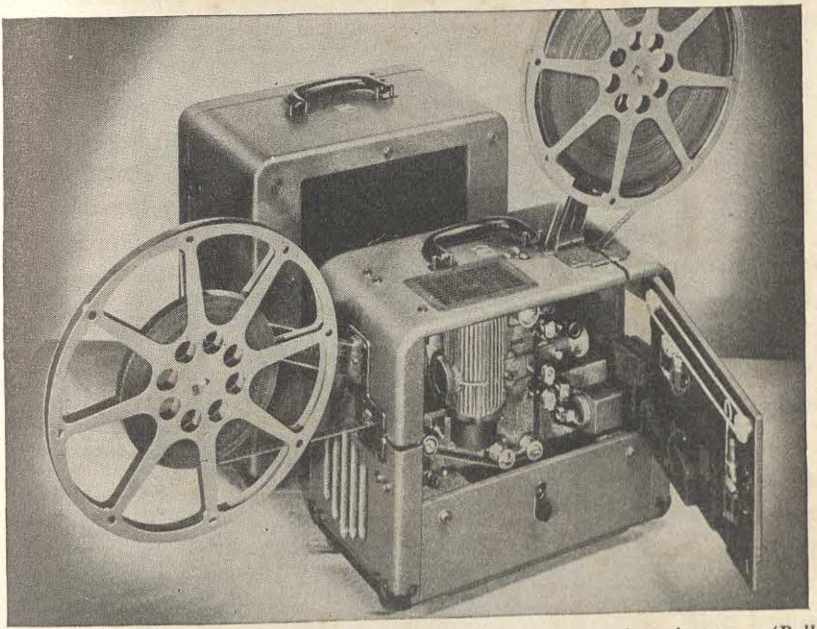

FIG. 1. The Filmosound is a good example of 16-mm. sound projectors. (*Bell & Howell.*)

One serious disadvantage at the present time is that few companies are producing silent films. However, the 8-mm. may revive interest in it. A second disadvantage is that the students are "sound-movie-minded." The motion pictures that they see at the theater are sound; hence they feel that the ones they see in school should also be sound. Consequently, some little readjustment in mental and physical attitudes becomes necessary. When the teacher has had more experience in using classroom films, she will teach the pupils to consider them as educational tools and not instruments of entertainment.

In summary, though overshadowed by the sound film, the silent film is not obsolete. Properly placed and utilized, it can contribute materially to the audio-visual program.

The sound film. This film is one on which the sound is recorded on the side in a space called the "sound track." Sound may be classified in one of three groups: (1) the oral explanation of the scenes or material on the film; (2) a combination of the oral explanation and natural sound, such as the tone of a musical instrument, the crash of a falling tree, or the roar of the waves breaking on the rocky coast; and (3) a combination of the oral lecture with a background of sound, generally music. Although many of the travelogues and newsreels shown in the school are of this third type, by far the great majority of classroom films are found in the first two classifications.

The chief advantage of the sound film is immediately apparent—a combination of the aural and the visual concepts. This naturally makes the classroom presentation quite lifelike. Films such as "Sound Waves and Their Sources," "The Brass Choir," and "The Fundamentals of Acoustics" would lose most of their value if sound were eliminated.

Another advantage is that the oral lecture, which is authentic and properly timed, directs the students' attention to the main points presented in the film. If the teacher is inexperienced in the use of films or is not thoroughly acquainted with the subject matter in her field, the oral text represents an even more important advantage of the sound film.

In the third place, the sound film may be effectively used with students who are experiencing some difficulty in reading because nearly all titles such as those used in the silent film are eliminated. However, one should not overlook the fact that a spoken word may be just as meaningless as the printed one.

A fourth advantage of the sound film is continuity; it is not necessary for the teacher to interrupt the theme with explanatory titles as it is in the silent film.

From the advantages of the sound film as listed above, it might be easily assumed that it is far superior to the silent film as a teaching aid. In some instances it might be; in others it might just as certainly not be. As pointed out at the end of the previous section, each of these types of film has its proper place in a program of visual aids. Both are necessary.

CRITERIA FOR THE SELECTION OF FILMS

Because motion-picture film is the most expensive of all projected aids, it should be carefully selected. In reality, this selection means two decisions: (1) whether or not to use a film in a particular classwork setting and (2) if advisable to use a film, a choice of the one considered most suitable.

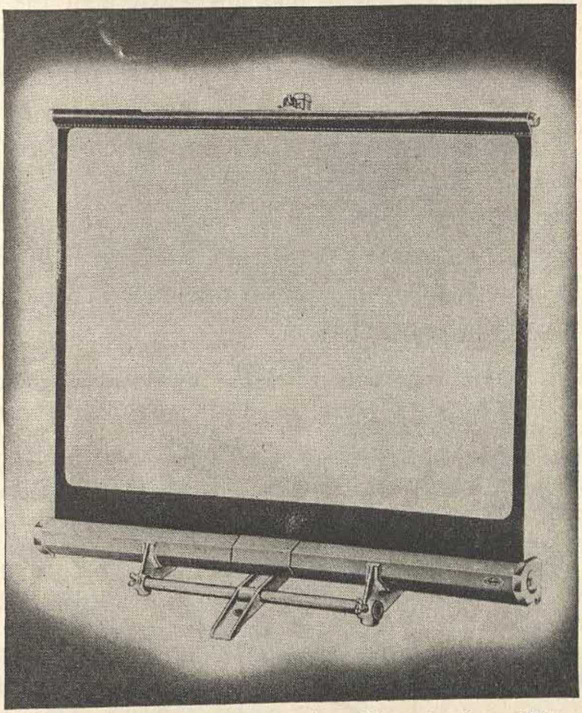

FIG. 2. A good screen is an essential to successful projection. This picture illustrates a desk mounting. When not in use the screen is rolled into the dustproof container and the frame is folded up. (*Da-Lite Screen Company, Inc.*)

Obviously, a film should not be utilized if some other aid will present the desired information, skills, attitudes, or techniques as effectively, or more effectively. For example, using a motion picture to show buildings, mountains, industrial plants, or other objects where motion is not an important element and which could be shown just as acceptably by flat or projected pictures represents an unjustifiable expenditure of funds.

Since motion pictures are really but a series of rapidly shown still pictures, the standards suggested for the selection of still pictures (see page 147) are quite appropriate when individual scenes of the film are being viewed. The following questions are also pertinent.[1]

1. Can the film be correlated and integrated with the course of study for a particular subject and a specific grade level?[2] Many teachers look upon the film as something set apart from their regular teaching materials. Consequently, much of the value of the film is lost unless it is of such a nature that it can be correlated with the course of study.[3] The film should fit in with other visual aids, such as maps, charts, posters, slides, and so on, that are normally used in developing a unit of work or a particular lesson. In addition, the pictures should be such that the pupils in the grade in which they will be used can easily understand them.[4]

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[1] It is difficult to set up specific standards for sound without taking into consideration the projector used, the conditions under which it is used, and the skill of the person operating it.

[2] An excellent reference on available films is "Educational Film Guide" published annually by The H. W. Wilson Company, New York. Quarterly supplements are issued. The films are arranged by decimal classification and by subject. All necessary details—length, width, running time, silent or sound, flammable or safety stock, name of producer or authorized distributors, and sales or rental prices, as well as full descriptive notes—are given in connection with each film. The 1947 catalogue lists 3,785 films.

[3] A number of publishers now include the titles of motion pictures, lists of slides and transcriptions and other aids that may be correlated with their textbooks.

The research staff of Encyclopaedia Britannica Films Inc., has prepared textbook-film correlations for approximately 270 widely used textbooks representing active publishers in this field. These correlations list titles of Encyclopaedia Britannica classroom films by chapters and units, thus providing a means by which teachers can readily select films to be used in conjunction with textbook materials. This correlation service is maintained on a continual basis. New correlations are prepared whenever the demand from the field appears to warrant it.

[4] A good check list to be used in the selection of a sound film will be found in M. R. Brunstetter, Selecting Educational Talking Pictures, *School Executive*, vol. 54, pp. 364–365, August, 1935. See also D. C. Doane, What Makes a Good Educational Film? *Educational Screen*, vol. 15, pp. 203–205, 239–241, 271–273, 305–307, September–December, 1936. Although W. M. Gregory's article, Stand-

2. Is the film authentic? The large majority of classroom films are authentic. The subject matter and content is passed by the research staff or collaborator before the film is released. This means that the work of some of the best known educators and leaders can be brought into the classroom. Two examples will illustrate: the bird series produced by Coronet Instructional Films was made under the direction of Dr. Arthur A. Allen, head of the Department of Ornithology of Cornell University, recognized as one of America's most eminent ornithologists; the series of Britannica films on the United States was produced in collaboration with Dr. Howard W. Odum, University of North Carolina, well known for his work in the field of geography. The name of the individual or institution collaborating in the production of a film is indicative of its authenticity.

3. For what purpose was the film produced? A film may be authentic in every respect, and yet the students may misinterpret it unless they are familiar with the purpose for which it was produced. Suppose a film has been made to emphasize the need for better housing in a particular rural area or in a specific zone in a city. The photographer selects the poorest buildings in order to make the need for better housing most striking. If, however, the students get the idea that the houses pictured are typical of all rural or urban areas, then the film, even though authentic, has been detrimental because its function was not understood. The instructor should understand, and see that the class understands, the purpose for which the film was made.

4. Are the pictures of good quality? Pictures that are not sharp, clear, and distinct represent a poor educational investment. Good

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ards of Geographical Films for Instruction (*Educational Screen*, vol. 19, pp. 95–96, 120–123, March, 1940), is built around geography, much of it is equally applicable to films in other subjects and fields. See also the symposium, The Correlation of Films with Textbooks by A. J. Rosenberg, C. W. Sorenson, C. J. Hylander, M. Brittman, and E. Bender, *Educational Screen*, vol. 26, pp. 543–549, December, 1947, and C. F. Hoban, Jr., Films and Textbooks, *Educational Screen*, vol. 24, pp. 445–446, 449, December, 1945.

In addition to publishing helpful catalogues and the *EFLA Bulletin*, the Educational Film Library Association, Inc., sponsors a Film Evaluation Service, which, by means of competent committees at cooperating institutions, appraises new films. The evaluations of these committee members are made on a standard sheet and are returned to the office where they are compiled and edited; the finished appraisals are then sent out to members in groups of 20 once a month during the school year. At the present time there are about 400 Institutional and Personal members of this association.

pictures attract, that is, they are pleasing to view. Since an unattractive picture fails to interest the learner, it discourages learning.

5. Is the content of the film limited to pertinent facts? Irrelevant facts, processes, or episodes, even though they may be interesting, add nothing but useless expense to a film. In fact, they may be distracting.

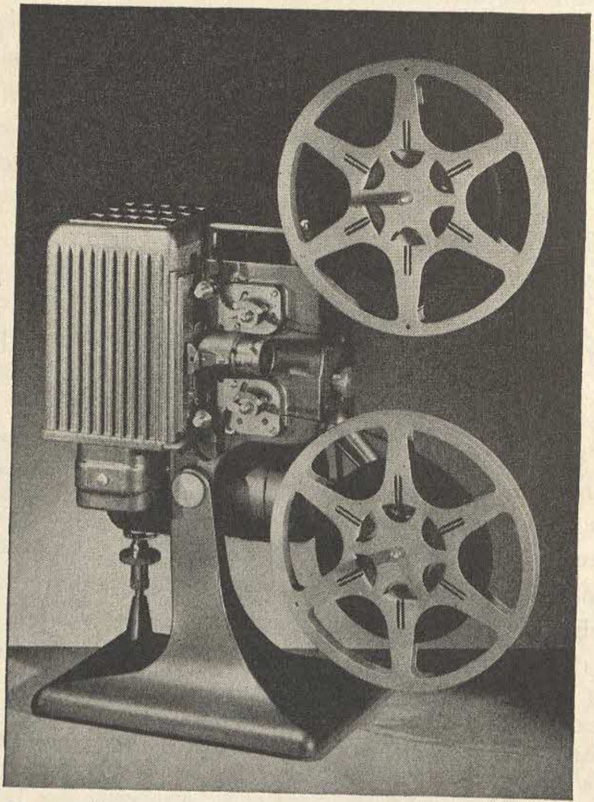

FIG. 3. The 8-mm. silent motion-picture projector. (*Eastman Kodak Company.*)

6. Does the film meet reasonable standards of technical excellence? A film should be smooth and steady. The central object, theme, item, or emphasis of the picture should be plain and intelligible. Scenes dealing with certain processes or periods of development, such as the sealing of salmon cans or the opening of a flower, should be taken and shown in close-ups. All the scenes should reflect good composition. Actors should seem natural and carry their parts well because the children of today are accustomed to seeing good acting; probably

nothing will decrease the students' respect for a picture more quickly than amateurish acting. If animation is used, it should be sharp, clear, and to the point.

7. Does the film possess good motivating qualities? A film that is a "closed and forgotten book" when the students have seen it is usually an inferior educational picture. A good educational motion picture leaves the student with a desire to learn more about the material portrayed.

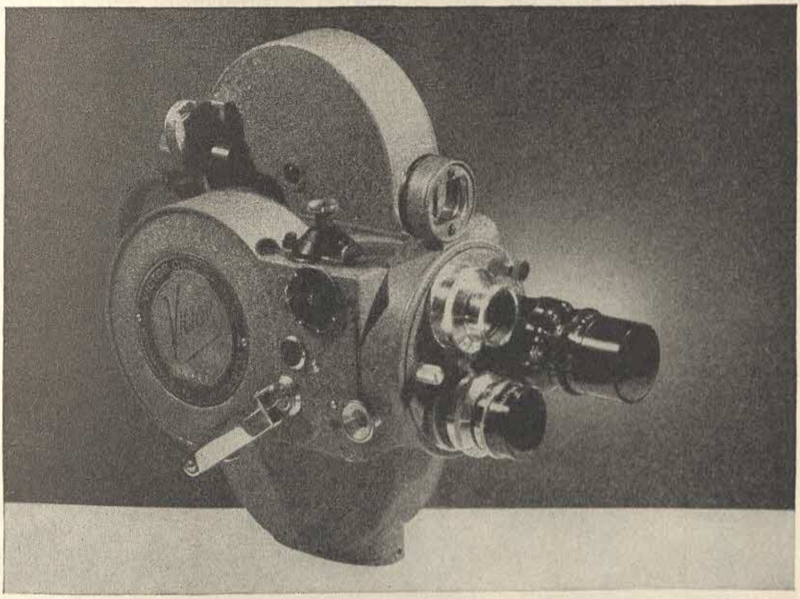

Fig. 4. The compact modern motion-picture camera is quite different from the cumbersome box of a few years ago. And it takes better pictures. (*Victor Animatograph Corporation.*)

8. Is the film a good financial investment? In answering this question, one should determine, if possible, the number of times that the film will probably be used each year. If it is of such a technical nature that it will probably be used in only one or two classes, then it should be rented, not purchased. On the other hand, if the film will be used several times and in several subject fields and if care is taken to ensure proper handling and storing, it will be more economical to buy than to rent.

CARE AND STORAGE OF FILMS

Films are not only expensive in original cost but also in depreciation. A little care in using and storing them will decrease this second expense by adding considerably to their length of service. The life of the film depends upon use, care, condition of projectors, and storage.

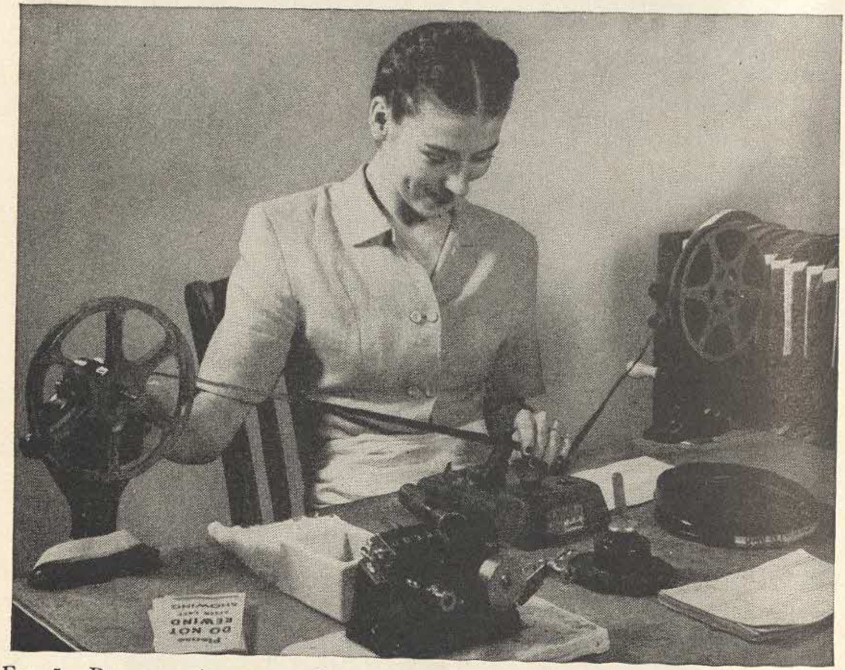

FIG. 5. Proper maintenance of motion-picture film necessitates frequent careful inspection. (*Courtesy of Visual Aids Service, University of Illinois.*)

Care. The audio-visual director should run a new print through the projector to condition it before sending it out for use. In many instances this procedure will ensure a much longer period of usage. The film should be rewound and checked immediately upon its return to the audio-visual center for sprocket-hole nicks, tears, edge cuts, scratches, and other mutilations. Torn sprocket holes should be cut out before they cause further damage. Broken films should be properly spliced. At regular intervals the films should be cleaned. This not only removes dirt and grease but also moistens the films. The workroom should be equipped with rewind machines, splicers, and a film cleaner or conditioner.

The condition and operation of the projector are also vital factors in the life of the film. Unnecessary film damage by faulty threading or operation can be avoided by having a thoroughly trained operator. Proper care of the projector will pay high dividends in added years of satisfactory service and also guarantee a longer life to the film. Suggestions for the care of the projector will be found on pages 241–242.

Storage. Films should be stored out of the direct rays of the sun in a room that is relatively cool. If possible, a higher degree of humidity should be maintained in this room because if films are allowed to dry out, they become brittle and are very easily broken. When not in use, films should be kept in the metal container. Shelving should be provided in order that each film has its own compartment; any one film can then be removed without moving the others.

To facilitate checking, each film should be identified, preferably by title and number according to the Dewey decimal system. There are two methods by which these identifications can be placed on the containers: (1) remove the finish from the edge of the container with a wire buffer and write the identification on in India ink, covering it with a coat of shellac after it has thoroughly dried, and (2) type the identification on a piece of white paper, glue it onto the can, and cover with cellophane tape.

MOTION-PICTURE PROJECTORS

In a few years the motion-picture projector has become a standard piece of regularly used equipment in all progressive schools. The light, durable, and inexpensive projectors of today are in sharp contrast to the big, heavy, and expensive machines of a few years ago. The older machines required considerable skill in operation, but since those of today have been simplified, any intelligent high-school boy can, in a very short period of time, be trained to operate even a sound machine.

This point should be kept in mind: In order to make its maximum contribution to the educational program the motion-picture projector must be used in the classroom where it can be correlated with all other materials of instruction. Used here it will also help to avoid the distractions always brought by a strange room or environment. The decreased size and weight of the modern projector and the use of coated lenses that increase illumination have resulted in a machine that can be used in almost any room.

Size of projectors. The size of a motion-picture projector is stated in terms of the width of the film used, and this is measured in millimeters. The theater projector takes a film 35-mm. wide and is therefore classified as a 35-mm. projector. Most films of this kind are printed on inflammable stock, and hence there is some danger of fire. Consequently the 35-mm. projector must be housed in a fireproof booth. The great majority of states also require a licensed, and some communities a union, operator. Because of these restrictions, this size of machine is used in theaters and almost exclusively for auditorium work in the larger schools.

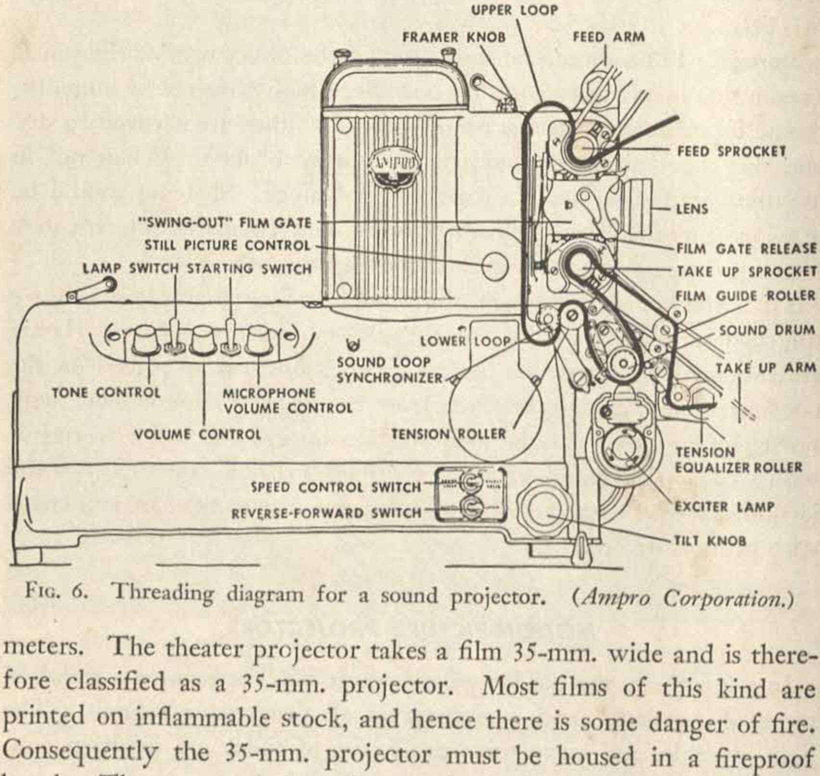

FIG. 6. Threading diagram for a sound projector. (*Ampro Corporation.*)

The 16-mm. projector has been accepted as standard for classroom use. The film is a little less than one-half the width of the 35-mm., is thinner, and much lighter. As the 16-mm. films are printed on nonflammable stock, there are no requirements of fire protection.

The larger 16-mm. projectors can be used satisfactorily in the auditorium. With these, carbon arc lamps may be desirable. One of the greatest difficulties to be overcome in the perfection of the 16-mm. machine was the inadequacy of light. A small bulb did not give sufficient illumination, and a large one burned the film. With the improvement of cooling systems for the lamp house and by the use of coated lenses, this difficulty has been largely eliminated.

The possibilities of the 8-mm. projector are now receiving serious consideration from school officials. Developed originally to meet the demand for an inexpensive family machine, improvements in illumination and the possibility of adding sound make it quite suitable for certain school purposes. Some films of this size are now available. Undoubtedly, this projector will have a place in the audio-visual program of tomorrow.

Types of projector. *The Silent Projector.* The motion-picture projector is simply a still-picture machine arranged to project a series of still pictures on the screen in rapid succession. The essential parts of the silent projector are the lamp, reflector, condenser, and objective lens. As the light must be cut off as the pictures change, a shutter—a rotating metal blade that comes between the light and the film opening while the film is being run—is used. The average 400-ft. reel of 16-mm. film contains approximately 16,000 pictures and requires about fifteen minutes for showing at silent speed. In this period, then, the film really starts and stops 16,000 times.

The silent projectors of today are built to meet these specifications demanded by the school situation: (1) lightness in weight, (2) compactness, and (3) simplicity of operation. Because so few 16-mm. silent films are being produced and since silent films can be shown on a sound projector,[5] few schools are now buying these machines.

The Sound Projector. This type of machine not only projects the picture on the screen but also reproduces the sound recorded on the track on the side of the film. It is practically the same as the silent projector. The additional parts are the sound head, the amplifier, and the speaker. The addition of these parts adds to the weight and size of the machine, as well as to the cost of production.

In general, the standards set up for the silent projector have been adhered to in the production of the sound machine. Many of the newer machines are not much heavier than the earlier silent projectors. They are compact, easily and quickly set up, and are simple to operate.

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[5] See footnote, p. 238.

Most of the sound projectors now on the market are constructed in such a way that the amplifier and loud-speaker may be used as a public-address system or with phonograph records. When used as a public-address system, a microphone is attached to the amplifier, and the volume is adjusted according to the size of the room. When used in this manner, two loud-speakers give better results than one. A phonograph attachment, similar to those used with the radio, may be used for playing records. Incidentally, phonograph records may be used to provide an appropriate background of music for silent films.

Sometimes it is desirable to use the microphone attachment for lecturing when a silent film is being shown.[6] Many teachers find it helpful to have the students summarize the film as it is being projected, instead of using the regular lecture on the film.

SELECTING A MOTION-PICTURE PROJECTOR

Before selecting a motion-picture projector, one should know just how and where it is going to be used most frequently. If it is going to be used almost exclusively in the classrooms, then the lighter weight machine will probably represent a good investment. If it is to be used for both the classroom and for auditorium and outdoor groups, then a large projector may be more desirable.

In comparing various makes of projector the following suggestions should be helpful:

1. Plan to have the various makes of machines demonstrated.
2. Arrange to have all demonstrations on the same day.
3. Arrange to have all demonstrations made in the room or rooms in which the projector is to be used.
4. If possible, have all demonstrations made during the daytime.

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[6] Silent films may be used on a sound machine. Some of the newer silent machines are constructed for sound films to be used on them, but this arrangement is not very satisfactory because without the explanatory titles and text much of the value of the sound film is lost.

5. Use the same type of screen for all demonstrations.
6. Use the same films for all demonstrations.
7. Try to have the same number of people in the room when checking on sound. The size of the group makes considerable difference in the acoustics of the room.

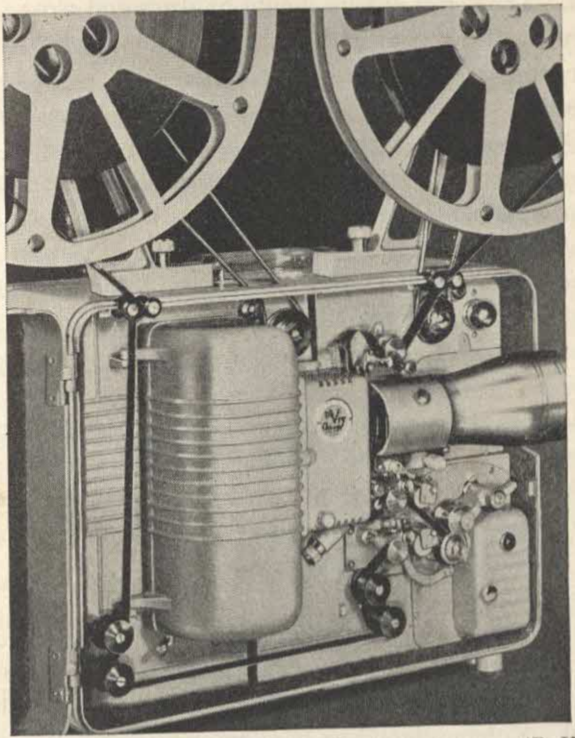

FIG. 7. The Bantam, a lightweight motion-picture projector. *(DeVry Corporation.)*

8. Be sure that each machine demonstrated is of the size being considered. It would hardly be fair to compare a light classroom projector of one make with a heavy projector of a different make.

In a consideration of the details of a projector the following points should be noted:

1. *Illumination.* In general, the projector should accommodate at least a 500-watt bulb, and larger if the room is not completely darkened. A machine that will take a 750-, 1,000-, or even a 1,250-watt bulb may be necessary if the situation requires it, but this is, of course.

more expensive because of the bulb used and also the additional power required.

2. *Steadiness of pictures.* Flickering or unsteady pictures are tiring on the eyes and, therefore, decrease the value of the film as a teaching aid.

3. *Focus.* The entire picture should be sharp and clear. Some machines vary in distribution of light, even as much as fifty per cent from the center to the edge of the picture.

4. *Operation.* Projectors should be simple to thread and easy to operate. All parts that are to be adjusted when threading should be easily accessible. All controls for operation should be conveniently located and the lamp house constructed in such a way that bulbs may be changed easily and with little loss of time.

5. *Protection for the film.* Devices designed to protect the emulsion on the surface of the film from scratches, to prevent damage to the sprocket holes, and in other ways to check unnecessary wear and tear on the film are desirable.

6. *Mechanical construction.* A good projector, one mechanically well designed and constructed, should give years of uninterrupted service. An inferior machine not only gives poor service but also requires constant repair. Replacement parts should be standardized and easily available at a reasonable cost.

7. *Portability.* The machine should be such that it can be moved easily from room to room. If it is heavy or unwieldy or difficult to set up, the teachers' use of it will be discouraged and handicapped.

8. *Sound.* The sound should be rich, clear, with good volume range and control. Volume should be loud enough for the largest room in which the machine will be used.

9. *Servicing.* Even the best machines require some attention, and, consequently, it is well to consider the reliability of the company and its provision for servicing.

Whatever the make selected, one should study and observe the instructions prepared by the manufacturer for maximum service.

OPERATION, SERVICE, AND STORAGE OF PROJECTORS

Operation. All teachers should be trained to operate the motion-picture projector. In addition, student operators should be trained and used when possible. Using student operators frees the teacher, and then she may give more time to the educational phase of the film. Boys who are mechanically inclined can soon learn to operate the machine successfully.[7] In any case neither teachers nor students should be allowed to operate a projector until they have had sufficient training. Films are expensive and may be ruined easily, on even the most costly machines, by an inexperienced operator.

The operator must know (1) how to set the machine up ready for operation and how to make all connections with speaker wires and power cords; (2) how to thread the projector; (3) how to focus the machine; (4) how to use the microphone and phonograph attachment; (5) how to change bulbs or exciter lamps; (6) how to rewind films; and (7) how to place projector, loud-speaker, and screen in order that best projection results will be obtained.[8] Good care and efficient operation of projectors will increase materially the value derived from any visual-instruction program.

Service. Unlike the still-picture projector, there are many moving parts in the motion-picture machine, and it therefore requires more care and attention. Only a person who has been properly trained should have this responsibility. The projector must be oiled frequently. In oiling, one should see that no oil is left on the machine where it can get onto the film. Reflector, condenser, and lenses should be cleaned frequently with regular lens tissue. The edges of the film aperture should be cleaned with a small brush. Lint or dust on the aperture gives the edges of the picture a ragged and indistinct appearance on the screen. The film track should be cleaned in order to remove all particles of dirt and other substances that might damage the film. Bone scrapers should be used for this purpose. All extension and speaker cords should be neatly coiled or wound on a spool when not in use. It is advisable to keep on hand several extra bulbs, tubes, and other parts that may be needed in servicing the machine; then, when necessary, simple repairs or replacements can be made immediately. Portable projection stands will facilitate the use of the motion-picture projector.

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[7] "Suggestions for Organizing Student Operators' Club" (1948) by C. R. Crakes, may be obtained free from DeVry Corporation. See also R. Mognis, Operators' Corps: It Saves Audio-Visual Time, Money, *Clearing House*, vol. 22, pp. 101–102, October, 1947.

[8] Screens for the motion-picture projector should be selected on the same basis as those suggested for the still-picture projector on pp. 185–186.

Storage. When not in use the projector should be kept in a warm, dry room. It should be protected as much as possible from dust. Most projectors come in protective cases. These should be closed when the machine is not in use. Obviously, care should be exercised when a projector is placed in or removed from the case.

CONCLUSION

In concluding these two chapters on the motion picture it is well to stress again the importance of a correct understanding and appreciation of the contributions of this audio-visual aid and the fact that these contributions can be made only through wise selection and proper use of equipment and materials. Otherwise, the investment of time and money represented cannot be justified. The possibilities of error or misuse should not discourage the teacher. Instead they should be considered a challenge that will bring out her most conscientious efforts. The thrill that will accompany mastery of this new educational device will more than compensate for minor disappointments.

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[9] See also footnote 15, p. 214.

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II

SCHOOL TRIPS AND TOURS

I: PURPOSES, TYPES, AND DESTINATIONS

The movement in American education to develop the school trip, field trip, tour, excursion, jaunt, or journey is hardly three decades old, but the basic idea is not new.[1] Both Aristotle and Socrates used the trip method; Comenius recommended it; Rousseau considered it the chief technique in the education of Emile; Pestalozzi promoted it in his school at Yverdon; and Francis Parker introduced it into his famous Chicago school. For years trips have been an important part of the practice of European schools of all levels.[2] Although this educational device has developed tardily in the United States, owing largely to the reasons suggested below, it promises to become one of the major activities of kindergarten,[3] elementary, secondary, and higher schools, judging by the recent and present interest.

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[1] The term "excursion" is commonly used, but the authors prefer not to use it because it is too suggestive of a lark or a sightseeing expedition, neither of which accurately represents the school-trip idea.

[2] School trips were officially sanctioned in England in 1905 and in 1908 were subsidized by the London County Council. The British School Journey Association, which now publishes *The School Journey*, was organized shortly thereafter.

Interesting accounts of foreign before-the-war practice may be found in T. Alexander and B. Parker, "New Education in the German Republic," The John Day Company, New York, 1929; S. W. Downs, The School Journey Movement in Great Britain, *School and Society*, vol. 42, pp. 541–542, October 19, 1935; C. F. Hoban, School Journeys in England, Germany, France, and Belgium, *Educational Screen*, vol. 9, November, 1930; and English and German Students Make Long Trips at Low Costs, *School Life*, vol. 16, pp. 146–147, April, 1932.

[3] Says Leila V. Stott, "By five years of age, however, the children are ready to be farther afield on school trips. Their block play usually reflects an interest in automobiles, boats, and trains; and following these leads we go often—about once a week in good weather—to near-by docks to watch coal being unloaded onto trucks; or again to railroad freight yards to watch the handling of food supplies. . . ." *Progressive Education*, p. 335, April, 1931.

The influences that are facilitating this development of the school trip in American schools are (1) a broadened outlook on the part of parents and professional educators; (2) a sincere desire to capitalize on all of the instructional opportunities, materials, and devices available; (3) a recognition and appreciation of the educational possibilities of the school trip;[4] (4) a knowledge of successful European practice; (5) the ease and low cost of modern transportation;[5] and (6) the hearty cooperation of officials of visiting points or destinations.

Reasons for the tardy development of the school trip in the United States. For a long time many of our schools have scheduled a few trips, but up to comparatively recent years nearly all of these were of the glorified school-picnic or day-outing type. That the movement to develop the school-trip idea intelligently, constructively, and vigorously is of recent origin in America is attested by the paucity of pertinent literature twenty or twenty-five years ago. Briggs and Merriam in 1921 and Collings in 1923 were among the first to emphasize the importance of this educational device and to describe how it might be utilized.[6] During the past decade a great many articles have been published and addresses have been made on this topic.[7] Most of these are not theoretical discussions but descriptions of trips actually made. Although this is gratifying, it is rather surprising that in America the school trip developed very slowly. One does not have to seek far to find the reasons for this tardy development.

In the first place, American education has always been schoolhouse-bound; to the average individual "education" has always meant a mosaic of very definite and formal elements—school building and grounds, classes, recitations, assignments, examinations, marks, promotions, regular attendance, punctuality, recess, a highly organized and systematized nine-to-four schoolday, a Monday-to-Friday week, and so on. Because of these elements and their emphases it was but natural that the school should come to be considered not one but *the* educational institution of the community. As a result, it has always been easy for the average adult to consider any away-from-the-schoolhouse activities as being cheaper, less dignified, and less educative than those inside it. Even today, when such a person sees a group of pupils visiting a bank, post office, museum, or mayor's office, he usually takes a "what-are-these-kids-doing-here, why-aren't-they-in-school?" attitude. Such a restricted conception has handicapped education in many ways.

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[4] Professional growth, certification, and academic credit is now given by a number of school systems, state departments of education, and colleges and universities. See "Professional Credit for Travel," American Association of School Administrators, Washington, D.C., 1948.

[5] In the Peoria, Ill., public schools, four busses are available for field trips at any time during school hours. These are requisitioned through the office of the Audio-visual Director.

[6] T. H. Briggs, The Excursion as a Means of Education, *Teachers College Record*, vol. 22, pp. 415–419, November, 1921; J. L. Merriam, "Child Life and the Curriculum," World Book Company, Yonkers, N.Y., 1921; E. Collings, "An Experiment with a Project Curriculum," The Macmillan Company, New York, 1923.

[7] The most complete bibliography published is "A Bibliography on Field Studies in Schools and Colleges," New Jersey State Teachers College, Upper Montclair, N.J. This booklet revised to Jan. 1, 1947, contains nearly 700 references. The 1938 edition of this publication contained about 450 references.

The second reason why the school trip came tardily is that American educators did not recognize its innate instructional possibilities and, therefore, did not provide the leadership necessary to a wholesome development of it. This failure is difficult to account for in view of the fact that the trip has been for so long an important part of European educational theory and practice. Short and long trips, scheduled for both winter and summer, interschool visits, pupil exchanges, winter and summer camps, youth hostels, and other phases of this movement have been common for years in certain European countries. Perhaps our educators were too busy with their own problems to give attention to this development; perhaps they had relatively few opportunities to learn about it; and perhaps they, too, felt that the child is educated in a schoolhouse and not away from it. In any case, the average American educator who visits foreign schools is always amazed at the extent to which instruction is carried on outside of the school plant.

The third reason why the school-trip idea has not been further developed is to be found in our mania for organization and system; we worship "businesslike efficiency" in education the same as we do in other activities, and we arrange more or less inflexible schedules, terms, recitations, promotions, and other mechanized and formalized routine, the elements of which would suffer if the longer and less regular periods necessary for trips were included. "Too much looseness would develop," is the way one principal expressed this idea. After-

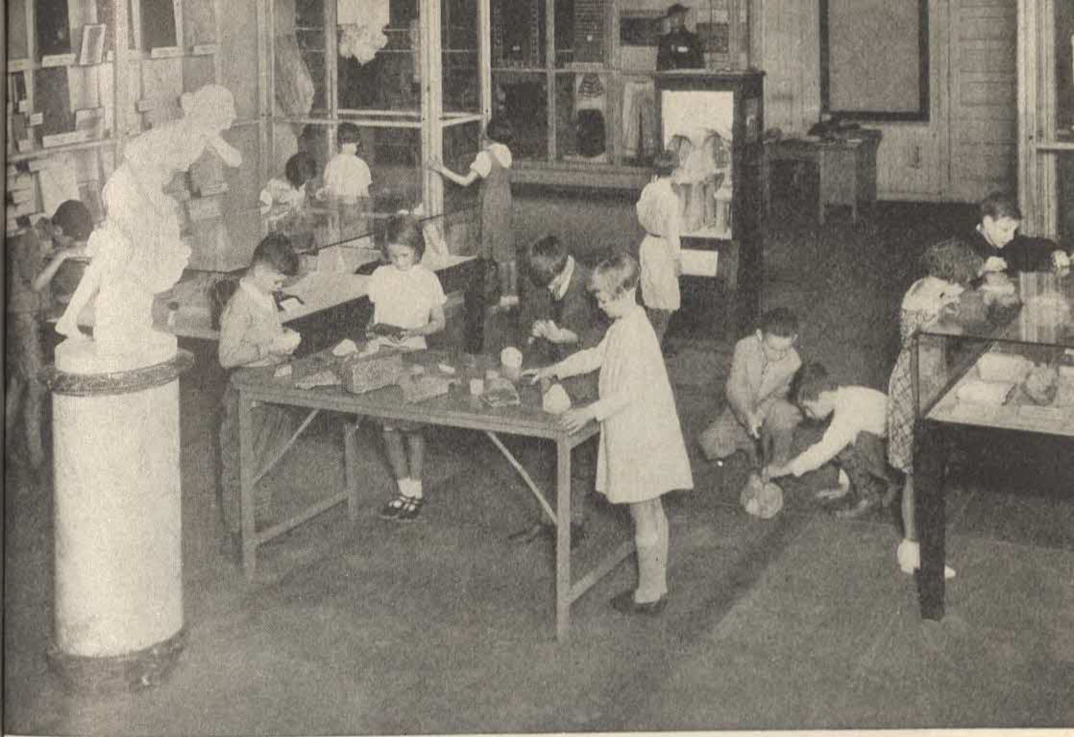

Fig. 1. These pupils are studying building stones and minerals. Note that provision is made for the actual handling of some of the specimens. (*Courtesy of The Philadelphia Commercial Museum.*)

school, evening, Saturday, and Sunday trips are often scheduled and conducted, but for obvious reasons they are usually not deemed so effective as those taken on regular school time and in direct connection with regular schoolwork.

In the fourth place, school trips have developed tardily in America because of our lack of experience with them; we do not have the basis of knowledge and experience upon which they must be built and, therefore, lack confidence in our ability to handle them successfully. It is much simpler, anyway, for the teacher to assign and hear a book lesson in the formal and easily controlled classroom setting than it is for her to initiate, organize, promote, conduct, correlate, and evaluate a trip with its numerous and perplexing details. However, one must not be too severe on the teacher. Many a teacher realizes the potentialities of the school trip but is too handicapped by a full schedule of traditional work, and she hesitates to add to her load. Perhaps, in many instances, we should not be too hard on the school administrator because he, too, is handicapped by the traditional purposes, organization, procedures, and activities of the school. But all these are changing rapidly, and as one of the beneficial results, the school trip is coming into its own.[8]

THE PURPOSES OF SCHOOL TRIPS AND TOURS

Many justifications of the school trip as an important educational device have been made, but for our purposes these values will be grouped and discussed under four main heads.

To capitalize educationally the migratory instinct. Man is an animal, and like other animals he is by original nature a migrator; he wants to wander, explore, and "be on the go." He wants to sense new things, have new experiences, meet new associates, and live, temporarily at least, in new surroundings. This desire can often be attributed to a definite dissatisfaction with the present setting and to a correlative belief that a new setting will be more congenial. The grass on the other side of the fence always seems to be greener than the grass on this side. Even in the case of the runaway boy, who apparently "has everything he needs and wants," there is something missing or some physical, mental, social, or emotional element that is not completely satisfying. And sometimes even he cannot logically explain or justify his actions at all. Probably this urge to migrate is nature's method of ensuring continued existence; certainly it is in the case of migrating birds, insects, and animals. In any case, the boy who "plays hookey" is only acting naturally. His teachers, when they were his age, felt the same craving, and probably many of them also played truant. Perhaps, occasionally, some of them still do.

The unenlightened teacher labels the expression of this inner drive "unnatural," "immoral," "detrimental," "vicious," or "unsocial," and attempts to suppress it. The enlightened teacher recognizes it as natural and seeks to discover ways and means of capitalizing on it for wholesome educational ends. She capitalizes on it in two ways; first, vicariously, by having the pupil project himself into his history, geography, English, foreign language, music, art, commercial work, or science, and live, in his imagination, the lives of other individuals in other times and in other climes.[9] In the second place, she capitalizes on it through actual trips to nearby and distant points where the pupils have direct experience with individuals, events, activities, and things, which help to interpret and enrich the material of these subjects. In short, the school trip, properly initiated, organized, conducted, correlated, and evaluated, represents an excellent capitalization of this migratory urge.

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[8] According to Atyeo (see reference in footnote, p. 264) Philadelphia was one of the first cities, and Pennsylvania's State Department of Visual Education was the first state education department, to give official recognition to school trips. The Association of Childhood Education first sponsored the idea nationally. "School Tours" (Circular 177, U.S. Office of Education, Washington, D.C., January, 1939) is an investigational report of school trips "lasting at least one full day and participated in by a considerable number of high-school pupils."

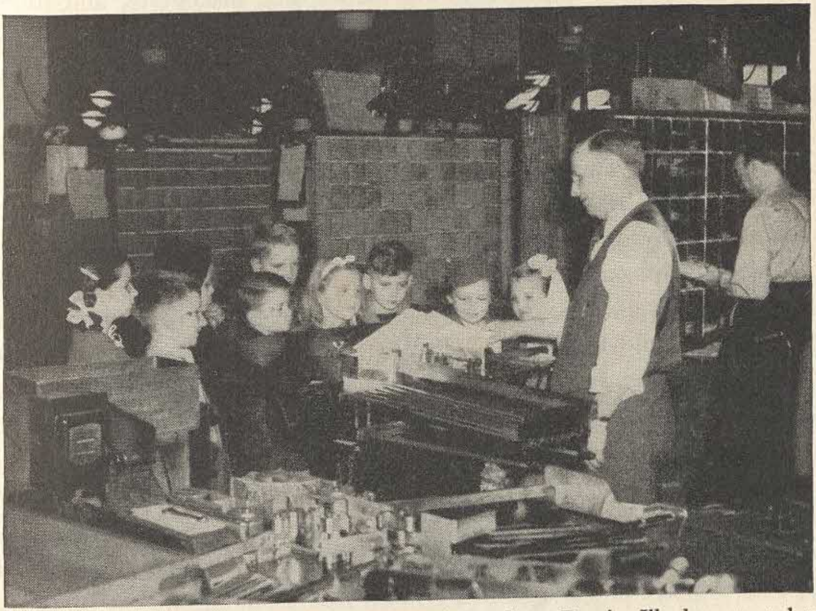

FIG. 2. This behind-the-scenes experience helps these Peoria, Ill., lower graders to understand the various details of mail handling. (*Courtesy of Virginia Heimeshoff.*)

To acquaint the pupil with his environment. The main objective of education—wholesome citizenship—must of necessity be based on an intelligent interest in, and an accurate knowledge of, the elements of one's environment—factors of earth history, topographic and weather elements, ideals, traditions, history, customs, organizations, institutions, and relationships—as reflected in the many phases of his social, physical, industrial, commercial, professional, emotional, recreational, educational, and spiritual life. Some of these concepts may be acquired from casual contacts and relationships, some from formal school objects, and some from extracurricular activities (School Trips has always been a standard chapter in books on extracurricular activities); but many of these experiences are incomplete, inaccurate, and unintriguing because they come indirectly. Generally, too, they are unorganized and unsystematized and thus represent merely miscellaneous accretions.[10]

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[9] See the discussion of "The Imaginary Tour," p. 258.

When the pupil in a purposeful and definitely planned trip visits a fire department, court or council in session, post office, charitable institution, industrial or commercial establishment, famous memorial, natural wonder, place of scenic beauty, or an area of geologic interest, he acquires information that is complete, accurate because it is correlated with some idea or relationship that is being presented in his schoolwork, and functional because it is direct and firsthand. The trip is a vital connecting link between school life and real life. It provides vestibulary learning, a very definite introduction to the important phases of community life.

Even in trips to more distant points the pupil is really becoming acquainted with his own community because these trips bring him into contact with things that his own community might or might not profitably have and also afford him an understanding of the relationships that they may bear to the institutions, individuals, events, and activities of his own community. The importance of these trips becomes all the more evident when it is realized, as has been suggested before, that man's modern life is far more complex than it was when the community was largely independent and self-sustaining.

W. M. Gregory very aptly evaluates school trips in these words:

> Education has been too far removed from the basic experiences of modern life. Many schools are quite deficient in opportunities for sense per-

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[10] Hoban, Hoban, and Zisman tell how one group of pupils "assembled a weird collection of piano boxes, pasteboard cartons, orange crates . . . out of which they hammered together what was supposed to be a post office . . . went through the motions of buying stamps, writing and mailing letters, and delivering mail. Not two blocks from the school was a real post office . . . where real stamps could be purchased . . . real letters could be mailed to real people, and from which real replies to these letters could be received, delivered by a mailman in the flesh" (p. 29).

ception, exploration, and raw experiences. They need fewer words and more activities with things, situations, conditions and relations. For useful learning pupils require experiences with the raw materials of life. A garden, a shop, a live animal collection, a trip to a farm, a mill, a store, a fire station, a post office, a park, a museum, etc., all have a place in the modern school. Many of these raw materials and elementary experiences are so common to the adult that their importance to the child is apt to be overlooked.[11]

To interpret, supplement, and enrich curricular experiences. A great deal of the usual curricular work of the school is formal and academic and hence lacks vitality. The average bookish description of a waterworks plant, the workings of a bank, the publication of a newspaper, the activities of a city council, the significance of some great memorial, or the wonders of some natural phenomenon, are unappealing to the average student because they are more or less remote from reality. As a result, they are difficult to understand. Of course, these book accounts are necessary, but how much more interesting and meaningful they become when they are supplemented by actual first-hand experience with the items in their functional relationships or settings; when the pupil sees how water is obtained, purified, and distributed; when he follows a check through the bank; when he witnesses the getting out of the newspaper; when he listens to the discussions in the council chamber; when he stands in reverence before some memorial or in awe before some natural phenomenon. Seeing a beautiful church, hearing the machinery in a factory, smelling the odors in a gas plant, feeling the heat in a steel mill, or tasting samples in a bakery give quite different experiences than would be gained by merely reading about them or in looking at pictures of them.

Such sensory experiences are not complete in themselves; they must be very definitely related to the organized material of the courses that students are taking. But they certainly can most appropriately and effectively interpret, enrich, and supplement the formal accounts. Hoban, Hoban, and Zisman state, "The school journey . . . is the most real and the most concrete of the visual techniques . . . and it is the most accessible and often the least expensive." [12]

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[11] W. M. Gregory, Modern Aids for Experiences in Learning, "Eighth Yearbook," pp. 85–86, Department of Supervisors and Directors of Instruction, 1935.

[12] Hoban, Hoban, and Zisman, *op. cit.*, p. 30.

Educationally, the school trip is also profitable in other and more general ways. The pupil's interest in the work of the world, as represented by its literature, history, science, art, music, events, personages, and activities, is stimulated, and, consequently, the extent of his knowledge and appreciations is increased. With this comes an increased ability to discuss, explain, and write about—all of which represent functional educational settings and media. He learns to observe more closely, to understand relationships and implications, and to discriminate and appraise in terms of relative importance; in short, he learns to think more clearly about these various things and their social significance. Further, his range of interests is broadened, and his standards of leisure are raised in quality because of these trip experiences. He learns to discriminate and to think in terms of relative values.

To give the pupils actual practice in purposeful planning and executing. Obviously, a successful school trip does not just happen; it must be wisely conceived, ably conducted, and profitably capitalized. The numerous details of purpose, points or objectives, plans, organization, execution, and utilization of necessity must be thought through, evaluated, selected, and carried out.

In this connection there are three possibilities: (1) the teacher may do all of the planning and executing; (2) the pupils may do these; and (3) the teacher and pupils may together work out the details and handle the event. Although the first possibility may result in desirable efficiency, it robs the pupils of educative opportunities. The second plan is not feasible. The third plan is the best of the three because it capitalizes both pupil and teacher interest and experience and in this way helps to make the event attractive and successful in its direct effects in connection with classwork and in its indirect effects through the very real and natural experiences that the pupils receive in helping to plan, organize, and execute it.

Because of its limited possibilities, this fourth purpose of the school trip is not so important as the three others discussed, but it does represent a minor value of merit.

TYPES OF SCHOOL TRIP

By school trip is usually meant a short morning or afternoon journey to some neighboring building, museum, program, office, or plant.

Although this is the most common type, it is not the only one. There are several other kinds of trip that schools increasingly are finding profitable. A brief explanation of each of them will indicate its general field and opportunities.

Local school trip. This, the simplest type of school trip, is one in which the group visits various points, parts, or sections of its own building and grounds. It may be a visit to another class, the office, the engine room, the stage of the auditorium, the motion-picture booth, shop, laboratory, or other inside point of interest where the relevant processes, procedures, equipment, and materials are explained and discussed. The outside trips are to the school grounds for such purposes as measuring distances; laying out a baseball diamond; plotting an acre of ground; demonstrating and practicing health and safety procedures; studying trees, shrubs, rocks, minerals, flowers, or soil, or the architecture of the building; watching, checking, and studying traffic past the building; or practicing safety in the streets. Many schools make use of the most appropriate of these trips in the orientation of their new pupils. However, other trips in this category may easily grow out of regular classwork. Usually these trips require not more than a regular school period and are scheduled for these periods.

Community trip. This is the usual "field trip" to some nearby exhibit, farm, fishery, library, museum,[13] woods, railway station, wharf, or other destination outside the school. It is the most popular type of school trip and usually requires a longer time than a single period—often a half-day and sometimes a day or two. Often these trips are taken in the evening and on Saturday as well as during regular school time.

Tour. The tour or journey is a trip lasting several days, a month, or even an entire summer,[14] usually made to some more or less distant place. This type of trip is developing rapidly in America due to (1) the influence of the practice in European schools; (2) common practice in America of overnight hikes, trips, and camping by the Boy Scouts and other organizations; (3) the evident success of such trips taken by some high schools; and (4) the ease of transportation.

Extended trips by smaller groups, such as a judging team, prize winners, exhibitors, and contestants, as well as by larger groups, such

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[13] See the books by E M. Moore and G. F. Ramsey. Also the footnotes, p. 80.

[14] A few years ago a group from the Riordon School, Highland Falls, N.Y., spent three months in Washington in a firsthand study of the Federal government.

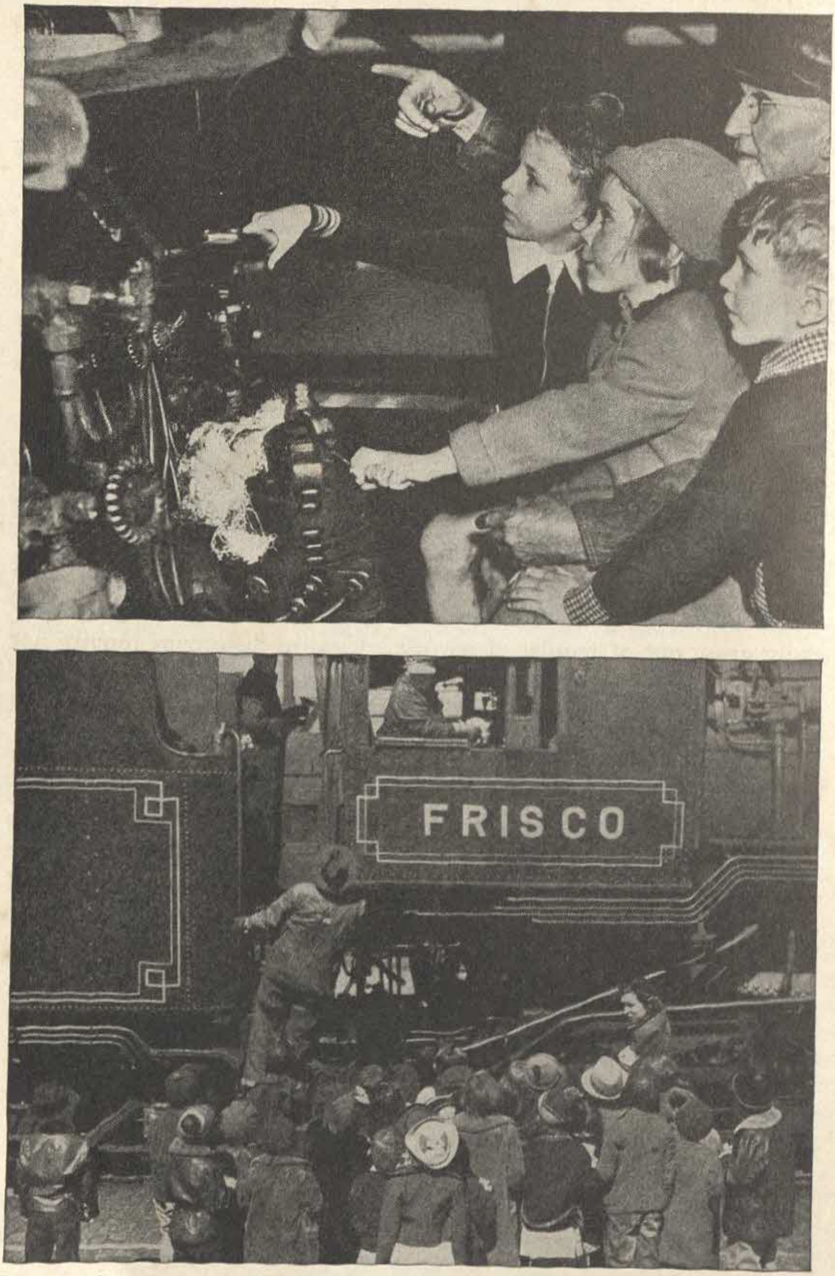

FIG. 3. These lower grade pupils are getting an outside and an inside view of the locomotive. (*Courtesy of Atlanta, Ga., and Springfield, Mo., Public Schools.*)

as a class or even occasionally by an entire school,[15] to such objectives as the state capital, national capital, a large city, a natural wonder, a great exposition, a college or university, the schools of another city, or a tour including several of these and similar destinations are becoming popular in both elementary and secondary schools. The pupils are transported by school, or specially chartered, busses, by private automobiles, or by train (often at reduced rates), and stay in hotels, college dormitories, Y.M.C.A.'s, Y.W.C.A.'s, or similar institutions, or in their trailers, in cabin camps, in tents, or in private homes as guests of children of about their own ages.[16]

The responsibilities for this type of trip are greater, the expenses are heavier, and the planning, organizing, and executing are more complicated. However, these are not unsurmountable difficulties. We may expect to see a considerable development of the school tour and especially the college tour within the next few years, perhaps even international tours such as are now scheduled in connection with some college and university courses.[17]

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[15] A group of 487 students from the Dover, Ohio, High School once took a three-day trip to Washington, traveling in a 12-coach special train. Stephens College, Columbia, Mo., featured an annual tour (up to the war) for 15 years. The 1940 tour to Mexico was made by 600 girls traveling in three special trains especially equipped for educational purposes. Six days were spent in and around Mexico City. The 1941, 15-day tour to the West Coast was made by 650 students.

[16] Information concerning hostels—inexpensive stopping places for young people—may be obtained from American Youth Hostels, Inc., 6 East 39th Street, New York. More than 200 of these hostels have been established in 28 states. See also the article by F. T. Downing. A promising recent development, the proposed High-school Travel Association, in which member schools would provide schoolrooms for sleeping quarters and cooking facilities for overnight stops, is described by R. G. Ruste in Students All over the Map, *School Executive,* vol. 58, p. 17, December, 1938.

[17] The SPAN (Student Project for Amity Among Nations) plan was originated and developed by students at the University of Minnesota, and the first group of 40 highly selected students went to four European countries during the summer of 1947. Each of the four groups was accompanied by a college instructor. The students lived with foreign families, attended no regular classes but studied firsthand, paid their own living expenses, and worked on what interested them most. This trip grew into Social Science 61–62, a 12-credit course. Forty other students, selected from many times the number applying, made a similar trip in 1948. SPAN Inc., has been organized to spread information about the plan and to gather funds for the travel expenses of these trips. A number of other colleges and universities are adopting this plan. The University of Chicago

The imaginary tour. This type of trip does not differ from the tour discussed previously except that it is not actually made. All the details of the real tour are investigated, studied, and planned. Materials are collected, decisions are made on trip destinations, and all of the other items such as routes, cost of passports, places and objects of interest, and the like are decided upon and theoretically arranged. The destinations are seen by means of motion pictures, slides, stereographs, photographs, maps, objects, specimens, models, talks, reports, radio, and recordings. Usually this type of trip grows very easily and naturally out of regular classwork in literature, music, history, geography, art, or some other subject and, naturally, is very closely correlated with it.[18]

Interschool visits. The aims, organization, and execution of this type of trip are somewhat similar to those which have already been discussed. The main differences are in specific purpose, length of period,

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sent 50 students over in the summer of 1948. This plan is described in *School and Society*, vol. 66, pp. 221–222, Sept. 20, 1947, and vol. 67, pp. 318–320, Apr. 24, 1948.

"Geography Field Trips" carrying three to six hours of college credit have been scheduled each summer by State Teachers College, Indiana, Pa., for several years. The 1948 trip was to Central and South America.

Pertinent material on longer tours may be obtained from Air-Age Education Research, Pan American World Airways, and Pan American Union, Washington, D.C. The first two of these organizations build their tours around air-travel. The second issues a monthly publication, *Pan American World Airways Teacher*.

[18] Four good references are G. C. Cole, An Experiment in Integration, *Journal of the National Education Association*, vol. 28, pp. 46–47, February, 1939; G. Thorpe, An International Good-will Tour, *The Instructor*, vol. 46, pp. 13, 65, 80, May, 1937; P. T. Williams, A Visit to the New England Capes, *Educational Screen*, vol. 15, pp. 142–143, 173–175, May, June, 1936; and P. E. Duffield, Global Music–An Audio-Visual Tour, *Educational Screen*, vol. 24, pp. 450–451, December, 1945. This article describes a correlation of films, filmstrips, slides, and records. The Williams article includes all of the plans for the particular unit from the first assignment to the final test.

The Pan American Union publishes "The Good Neighbor Tour," a series of ten mimeographed volumes, which represent a comprehensive course of study on the republics of Latin America in the form of an imaginary trip around the continent. Although planned originally for the Federation of Women's Clubs, this material has been found interesting and valuable by many schools and informal groups of students.

The Travel Section of *The Instructor* contains short and profusely illustrated articles that represent excellent material for the imaginary tour. For sources of other material see pp. 584–585. See also the reference to national and international exchange of correspondence and illustrated albums, footnote, p. 140.

formalities, and activities. There are three types of this interschool visit.

In the first type, a particular specialized group such as a class group, council, committee, publication staff, or music club visits the corresponding organization of the other school in actual session or meeting, thus providing for an exchange of ideas and plans relating to their mutual interests.

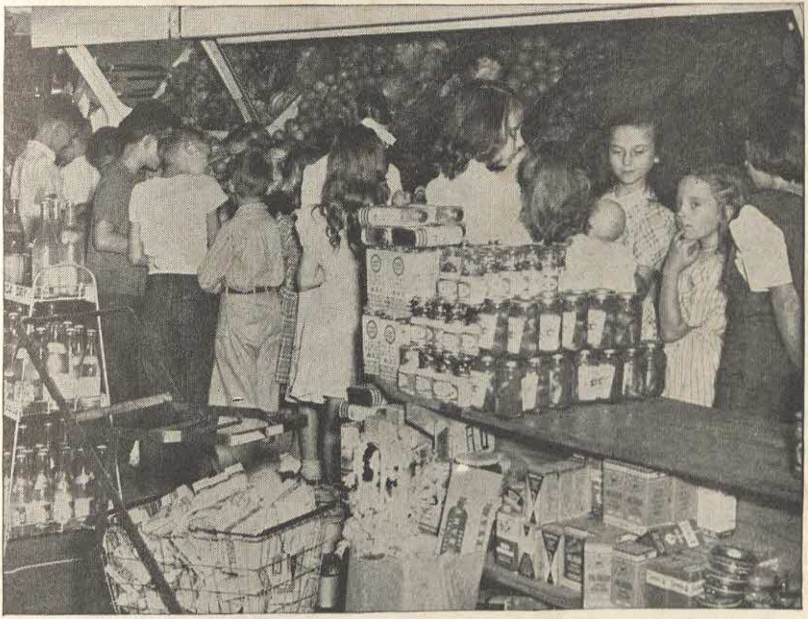

FIG. 4. For everyone concerned, a good investment of time and effort. These Montgomery, Ala., pupils are learning how to buy fruits and vegetables intelligently.

In the second type, a group, class, or even an entire grade visits another school for a half-day or day. The hosts welcome their guests with an assembly program, assign leaders to conduct them to the various classes and activities about the school or, better still, assign each guest to an individual host who assumes responsibility for him for the entire period. A tea, dance, party, swim, game, or other social or athletic feature is scheduled for them at the end of the day. The guests, individually and through their leader, thank their hosts—pupils, teachers, and principal—before leaving. Usually the guests later invite their hosts for a return visit.[19] An extension of this plan, somewhat common in Europe, is that in which schools exchange students and teachers, and even groups, classes, or grades, for a whole term, sometimes for an entire year, the visitors being taken into the homes that the other children have left.[20]

A third type of interschool visit, one increasing rapidly in popularity in the United States, is that in which the top grade or class of one school is invited by the next higher school—junior high school, senior high school, or college—to come as its guest for a day. The main purpose of this arrangement is to interest the students in the higher school, give them a bit of orientation, and stimulate them to anticipate entering it the following year. The general plans and organization of this type of visit are practically the same as those of the second type described above. Needless to state, this type of trip well merits the recognition that it is now receiving.[21]

The individual trip. In this the pupil takes the trip by himself either because of an assignment of some particular responsibility in connection with curricular work or because of his own specialized interests. Obviously, because of its very nature it is usually most vital and functional. The pupil who goes to the city library, museum, or a meeting to gather material for a class report, to the woods or fields to collect objects or specimens, to some home to talk with an old-timer, to some project or setting to sketch or take pictures, or to the railway station or bus terminal to obtain travel folders or timetables—this pupil is on his own; he learns to recognize, appreciate, accept, and discharge responsibility, and these are important elements in any education.[22]

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[19] Excellent and practical ideas will be found in R. Helms, Why Not Student Visitation? *School Activities*, vol. 7, pp. 26–27, April, 1936. See also footnote 16, p. 256.

[20] Last spring (1948) 20 students from the Wyandotte, Mich., High School visited Philadelphia for a week as the guests of 20 Radnor High School students. This was Wyandotte's third trip of this type. The first was to Canada, the second to Duluth.

[21] See Dean Fitzgerald's article, An Eighth-grade Day in the High School, *School Activities*, vol. 9, pp. 319–320, February, 1938, for a description of one of these visits.

[22] An account of individual trips will be found in B. Elliott, Excursions in Appreciation in the Small Town School, "Thirteenth Yearbook," pp. 286–287, Department of Elementary School Principals, 1934.

DESTINATIONS OF SCHOOL TRIPS

In every community, large or small, there are places of interest to which the pupils may profitably make trips, and nearly all of these may be visited and revisited year after year. Usually, too, there are places that are not open to visitors, some to which it is not advisable to take groups of pupils, and some that are hardly worth visiting. Even when these are eliminated, there will be plenty of logical and valuable trip destinations remaining.[23] The following list will suggest some of these.

Agriculture: farms–grain, stock, fruit, tobacco, cotton, dairy, school, experiment, irrigated, dry; processing plants–packing, ginning, stemming, milling, pickling, canning, condensing; stockyards, elevators, warehouses, and storage plants.

Art: galleries and exhibits; architecture; churches, homes and furnishings –rugs, wallpaper, pictures, and statues; cemetery; public works; landscapes and seascapes.

Clothing: factories; stores; cleaning, dyeing, and pressing establishments; laundry.

Clubs: fraternal, professional, and social; Y.M.C.A., Y.W.C.A., Y.M.H.A.; commercial, country.

Communication: telephone and telegraph–offices, exchanges, lines, plants; radio broadcasting station and studio.

Community Groups: religious, racial, national, artistic, occupational.

Courts: justice of the peace, magistrate's, city, traffic, police, juvenile, county, circuit, supreme.

Educational: schools–public, private, and parochial, night, adult, open air, military, nursery; higher institutions–college, university, technical school, business college; museum, gallery, library, theater, exhibits, meetings.

Engineering: bridge; highway; tunnel; viaduct; aqueduct; canal; garbage disposal plant; buildings; drainage and sewer systems; flood and erosion control; hydroelectric plant, dam, pumping station, power house; improvements.

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[23] A number of the larger school systems now issue guides for field trips. A good example is "It's Worth a Visit," published by the Los Angeles Schools. This bulletin lists more than 150 places that may be visited by school groups. Each of these destinations is catalogued with name, address, nature of activity, of interest to, time to visit, most appropriate group size, and other details.

Expositions, Fairs, and Exhibits of all kinds.

Factories: automobile, building supply, machinery, clothing, glass, ceramic, soap, tools, implements, weapons, furniture.

Federal: post office, court, lock, dam, mint, power plant, flood- and erosion-control devices, experiment stations, nature preserves, improvement projects.

Financial: bank, clearinghouse, broker's office, stock exchange.

Food and Drink Plants: bottling, ice cream, breakfast food, dairy products, ice, canning, packing, pickling, baking.

Health: center, clinic, sanitarium, hospital; first-aid station; safety-first provision in streets, homes, offices, factories; fire and disease prevention.

Historical: buildings, homes, settings, sites, shrines, memorials, markers, monuments; battlefields, cemeteries and burial plots; old forts; expositions; exhibits–documents, weapons, utensils, clothing and costumes, relics, old village, pioneer home, and furnishings.

Homes: slum, middle-class, and exclusive district; buildings–exterior and interior; furnishings, equipment, appliances, and grounds.

Hotels: flophouse, middle class, and exclusive; apartment and resort; restaurant.

Literary: library; exhibits; bookstore, publishing houses; authors' homes and haunts; graves, shrines; story settings and inspiration spots; dramatic events and activities; newspaper and magazine offices and plants.

Meetings: board of education, city council, court, legislature, political rally, conferences, forum, debate, lecture, address, symposium, program.

Military: fort, reservation, armory, post, airfield, school.

Mines and Quarries: coal, zinc, lead, gold, stone, gravel, granite; processing plants.

Municipal: departments, offices, plants; services–police, fire, welfare, safety, health, streets, water, jail, courts, garbage and sewage disposal; utilities–water, gas, heat, power, light.

Music: concerts, opera, studio programs; composers' homes and graves; inspirational settings; exhibits; publishing and recording companies; manuscript rooms; school, conservatory; instrument manufacturing plant; stores.

Nature: water and land forms–river, pond, lake, waterfall, island, hills, mountains, valleys, cave; geological formations; woods and fields; nature and forest preserves; bird and animal sanctuaries; public and private parks, arboretums, planetarium, floral and vegetable gardens, greenhouses, and nurseries; botanical and zoological gardens; scenic spots, phenomena, and curiosities.

Naval: station, ships, air station, airplanes, docks, yard, school.

Oil: wells, refining and processing plants, station, pipe lines, tank cars, tanker, filling station.

Penal Institutions: workhouse, detention home, industrial school, jail, penal farm, penitentiary.

Professional: offices of physician, dentist, lawyer, minister, banker, publisher, weather forecaster, insurance salesman, real estate agent.

Public Works: buildings, aqueduct, viaduct, bridges, streets, tunnel, waterworks, flood-control and other protective projects.

Recreational: swimming pools, beaches, playground, parks, courts, courses, camps, stadium, gymnasium, skating rinks.

Religious: cathedral, churches, synagogues, missions, schools, camps.

Shops: machine, blacksmith, plumbing, carpenter, printing, barber, beauty.

State: institutions, buildings, preserves, sanctuaries, services, organizations.

Stores: wholesale and retail; department, general, jewelry, grocery, street market, book, meat market, bakery, fuel yard, secondhand, five-and-ten, chain.

Transportation: land–railway, surface, elevated, and subway lines; bus lines; trucking corporations; terminals, offices, equipment, repair shops, freight and express services; automobiles and trailers, parking stations, camps, highways; water–ships and boats, ferry, docks, canal, dam, lock, ford, bridges; air–airport, hangars, airplanes, offices, shops, air events, races and shows, museum exhibits.

Utilities: municipal and private; water, heat, power, light, gas.

Welfare: settlement house, community center, agencies and institutions.

12

SCHOOL TRIPS AND TOURS

II: PLANNING, CONDUCTING, AND CAPITALIZING

The worth-while school trip is never a mere on-the-spur-of-the-moment or a sort of hurried "get-into-your-wraps, let's-go-somewhere" event. It is a carefully thought-out, planned, and capitalized educational opportunity. Any trip is important not only in itself but also in its influence on future trips and on the possibilities of these future trips. A successful event will promote the healthy development of this device, but an unsuccessful trip will discourage it. Therefore, especially because the device is relatively new in most schools, it is better to build slowly and substantially instead of hurriedly and flimsily. Teachers who are enthusiastic about trips may chafe at the apparent slowness of the development, but at the same time they, too, will appreciate the importance of correlating enthusiasm with competency. The following suggestions are designed to facilitate the development of this competency.[1]

Educate the teachers and students in school tripology. Obviously, the success of school trips depends basically on the teachers, not only because these teachers will have to do the necessary planning, conducting, and utilizing but also because every one of them will be affected directly or indirectly by these trips and, therefore, will have to take favorable or unfavorable attitudes toward them. A wholesome and hearty support of the faculty is essential. Probably few teachers have had very much practical experience with school trips, and hence the first step in the development of this device is to educate properly the faculty itself as to the value of trips.

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[1] Probably the best, single longer reference is Henry C. Atyeo's "The Excursion as a Teaching Technique," Teachers College, Columbia University, 1939. This book includes a wealth of practical material concerning all details of school trips.

Any group of teachers will represent many combinations of interest, knowledge, and experience, varying all the way from the one who has none of these to the one who has a good supply of all of them. Faculty support can never be developed by the principal merely expressing his own opinions and forcing the teachers to accept them just because they are his. Free and open faculty discussions; a study of available literature; reports of visits to schools that promote successful trips, and reports from the teachers and pupils of these schools; and a survey of the local possibilities are some of the mediums through which faculty interest and support may be developed.

In addition, the pupils will have to be enlightened concerning the general ideals, purposes, and practices of the school trip in order that they, too, will take proper attitudes toward the policy and carry support and accurate information to their parents. This enlightenment can be attained through the school publications, home-room and assembly programs, bulletin-board displays, exhibits, and reports from representatives of other schools that have had successful experience. As implied above, this education is general rather than particularized although it is, of course, well illustrated with examples from actual practice. Instruction in the specific details about contemplated trips is given just before the trips are taken.

Lead the community to recognize and appreciate the values of the school trip. A third important group, which must be suitably educated, is the community itself because a trip concerns its children, its settings, its employees, and its educational expenditures. Here again, because of the newness of the activity, instruction designed to break down the traditional belief that any education obtained outside of the school building is relatively cheap and unprofitable will have to be promoted. There are two possibilities in this connection—to plan and conduct a few trips and thus prove the value of the activity or to educate the community, win its support, and then promote the trips.

The weaknesses of the first plan are easily seen: because of inexperience or other causes there is a danger that the trips will not be completely successful; and also that the resultant attitudes taken by parents and patrons will be on the basis of incomplete information and improper appreciation—that they will represent snap judgments instead of careful appraisals. Such judgments, especially if they are adverse, will be very detrimental because it is always more difficult to change a person's mind once it has been made up than it is to help to formulate opinion before a decision has been made. In general, it is obvious that educating the community first and then promoting the trips is a more desirable procedure than the reverse. Further, this procedure will bring an added demand, owing to the extent of the publicity given in promoting community education, that the trips be successful. This demand should stimulate additional efforts on the part of the teachers and in this way help to ensure efficiency and effectiveness.

FIG. 1. The chief officer of the Hiram, Va., election board explains laws and procedures to these high-school students who are planning a school election. (*Courtesy of R. S. Hadsell.*)

This instruction on trips may be brought to such groups as the board of education, PTA, mothers' clubs, civic association, luncheon clubs, and church bodies. The devices used are somewhat the same as those suggested above: free and open discussions with ample opportunity for pertinent questions; studies of the literature available, reports of visits to other schools, and reports from the teachers and pupils of those schools; and a discussion of the local possibilities. The principal and faculty must accept responsibility for this program of education, and this means that they themselves must feel convinced of the educational value of trips.

Make a survey of the local trip possibilities. A class should initiate its program of trips by arranging for visits to destinations in the immediate community. Such trips are not only vital because they concern things close to the pupils but they are also inexpensive in time and money and are relatively easy to arrange and handle. Suggestions of destinations may be obtained from the pupils, teachers, parents, chamber of commerce, and other individuals and organizations. Making this survey as complete as possible the first time will mean making later surveys unnecessary and will also result in a longer and more varied list of possibilities from which to select. Incidentally, such a survey in any community, small as well as large, will always result in a surprising array of possibilities.[2] All should be included in the list, even those obviously dangerous, inaccessible, or for other reasons questionable. The listing and later evaluation of these as potential destinations will be valuable to the group, and it is entirely possible that some of these questionable destinations may be made quite suitable through proper precautions and arrangements. If a general policy of trips is being formulated in the school, representatives from the various classes may be selected to form a central committee in order that wasteful duplication does not result.

Once the destination has been decided upon, either immediately or preferably just before each trip is made, it will be necessary to collect pertinent information concerning it as, for instance, the name or designation; address or location; the educational values it may offer; the age and grade levels and subjects to which it is best suited; the methods, routes, and cost of transportation; the time most appropriate for visiting; the amount of time probably necessary for the trip; the size of the group that can be accommodated; the name of the person with whom arrangements should be made; and suggestions as to materials and methods to be used in preparation. McCallum points out that remarks, suggestions, and warnings should also be included in this analysis and that even such comments as "Let the children see the monkey last or you won't see anything else" or "Don't wear your good shoes when you visit the zoo" will be valuable. When making arrangements for a trip, it is reasonable to request these suggestions from those who are competent to offer helpful hints.

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[2] In Chap. II, The Environment as a Primary Source of Materials of Instruction, "Eighth Yearbook" (Department of Supervisors and Directors of Instruction, 1935), will be found an almost unbelievable array of possible trip destinations, together with descriptions of many trips actually taken.

Begin with short and simple trips. It is highly desirable that all trips should be relatively successful from both the pupils' and the teachers' points of view, but those that are promoted first should be especially successful because of the attitudes that will be immediately taken toward them by pupils, teachers, and parents. The successful planning and conducting of a trip are dependent on the successful planning and handling of the many and varied details that go to compose it. If the teachers have had only limited experience with these events, it is reasonable that they should promote only shorter, smaller, and simpler trips in the beginning. This policy will not only give them plenty of opportunity in which to master the details involved, but it will also guarantee that any failures will be relatively insignificant and hence result in a relatively small amount of adverse comment or criticism.

Establish and maintain cordial relations with those in charge of destinations. When the teachers and pupils visit some destination, they should be made to feel most welcome. If their reception is perfunctory rather than cordial, they will feel as if they are being merely tolerated as more or less unwelcome guests, and their enthusiasm will be considerably chilled. On the other hand, if they are made to feel that they are most welcome, that they are guests of honor, and that the proprietor and officials are really delighted to have the opportunity of showing them around, their resultant attitude is certain to be conducive to complete enjoyment and enhanced learning. The establishment of cordial relations is too important to be left to mere chance; provision for it must be very definitely made.

It is probably true that the trip idea is newer to the proprietors and officials than it is even to the teachers and pupils, and because of a lack of knowledge and appreciation they need not be expected to consider it much more than a high-class sightseeing expedition. Often, too, they may even consider it an interruption, a sort of imposition that must be patiently borne for good publicity's sake. In order to prevent or to change any such feeling the school authorities must develop a wholesome and cooperative attitude by educating these proprietors and officials in the ideals, purposes, procedures, and later utilization of this device.

If these trips are just being initiated, it is as logical that the first steps in the development of friendly relations should be made by the head of the school as it is that they should be made by the head of the destination or with the proper official, in case there is one. To illustrate: At the outset it is no more reasonable that these arrangements should be made by a teacher of the school than it is that they should be made by a bookkeeper, teller, mechanic, or lesser official or employee at the other end. Having the heads of both school and destination make the arrangement will give added importance and dignity to the event. Later, as suggested below, when the trips have become established and appreciated as a regular school policy, it may be quite appropriate for the teachers and even pupil committees to make the necessary arrangements.

FIG. 2. These visiting pupils listen carefully as the guide describes points of interest in New Salem, Ill., the village in which Lincoln spent his early manhood. (*Courtesy of Division of Parks, Springfield, Ill.*)

Generally, if not always, the first work in building this foundation should be a personal interview. Correspondence is too formal and too limited in its possibilities of explanations and discussion, and telephone conversation is too informal and casual to be important. Later, these means may be utilized in arranging details, but they are hardly satisfactory in making the first, and the most important, contact.

If a definite and permanent policy of school trips is being developed, it will be necessary to schedule later visits by other groups, and hence it is desirable not only to establish, but also to maintain, cordial relations. Any visit which cannot be considered by the cooperator as successful from his point of view, that is, which does not leave him with a sense of satisfaction, will handicap later visits. A courteous consideration of the cooperator's time, a careful observance of rules and customs, interested attention to explanations and descriptions, gentlemanly and ladylike behavior, and a sincere expression of appreciation at the conclusion of the visit will help to maintain cordial relations and thus pave the way for later visits. Pupils who will not cooperate in these matters should not be taken on the trip; they represent liabilities and not assets.

Plan all details of the trip carefully and completely. Specifically, intelligently, and completely thinking through and arranging the details of the trip—destinations, purposes, permissions from, and arrangements with, the cooperator, time, expense, routes,[3] methods of transportation, equipment, safety, comfort, courtesy, preparation, organization, supervision, guides or instructors, expression of appreciation, and final capitalization—help greatly toward guaranteeing its success.[4] In fact, the trip should be completely made in the imagination of the teacher or committee before the group steps out of the building. Checking and double-checking these plans is a wise procedure that may save costly inconvenience or delay.

Not only should the plans be carefully made, but, in general, they should be closely followed if for no other reason than that if they are not followed, the pupils will not invest much time or attention in making them for the next trip. Unforeseen and unexpected happenings will probably occur even in the most carefully planned event, and the necessary readjustments will have to be made; in any case, the more complete the planning, the fewer of these upsets there will be.[5] The part the pupils may play in arranging these details has already been suggested in the fourth purpose on page 254.

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[3] For bus and streetcar trips, some teachers provide each pupil with a plat or map which shows not only the route being taken but also the location of various interesting things along the way. A brief study of these is a part of the preparation for the trip. En route, the pupil follows his platted course, noting them.

[4] The most common criticisms of the longer bus trips are these: (1) irregular or improper stops for rest and meals, (2) the students' practice of loading up on hot dogs, candy, and pop at every opportunity, and (3) at night, the numerous kinds of sleep-discouraging activities that are carried on.

In the case of first trips to particular destinations, although it may not always be possible, theoretically, it is just as logical for the teacher to have had this pre-trip preparation herself as it is for her to have had pre-lesson experience and preparation in her subject matter. This pre-trip will not only provide the teacher with the accurate details of the procedures involved, but it will also bring her a feeling of self-confidence that will not be present if she, as well as the pupils, is taking her first trip to the objective.

Sometimes, for certain kinds of trips it may be necessary to obtain the permission of the parents. For this the use of a mimeographed or printed form on which the date, destination, time, and an explanation of the respective responsibilities and the school are set forth is satisfactory. For the longer trips nearly always liability insurance is required by state law. Where it is not mandatory and the school itself does not wish to take out such insurance, the school should obtain from the parents a formal permission to participate and a waiver absolving the school authorities from blame in case of accident. Some schools require a physical examination of all participants on these tours.

Make appropriate class or group preparation for the trip. As nearly all trips are made in connection with some class exercise, material, or project, they should develop naturally out of the class setting. The trip assignment is really but one form of the lesson assignment, and as such it must be based on good principles. A trip assignment of the "tomorrow-we-are-going-to-visit-the-post-office" type is no more helpful or justifiable than one of the "for-tomorrow-take-ten-more-problems" type. A good lesson assignment not only indicates and locates the materials to be covered but also stresses the importance of the next lesson, raises thought-provoking questions and challenges, warns of possible dangers and difficulties, and brings the pupil into contact with other materials that arouse his curiosity.

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[5] An excellent article to read in this connection is A. K. Lobeck, The Organization of Field Excursions, "Thirteenth Yearbook," pp. 274–277, Department of Elementary School Principals, 1934.

Similarly, with the trip a good assignment not only indicates the destination and its location but also stimulates the pupil to think about it in terms of its importance, purposes, practices, and personnel. The pupil attempts to visualize it and thus builds an atmosphere of anticipation. As has been, and as will be, repeatedly emphasized in this book, going merely to look at some object is neither so interesting nor so profitable as going to see the whats, wheres, whys, whens, and hows relating to it. Furthermore, the wise teacher will purposely bring the pupils into contact with other items or things that will arouse their curiosity and thus plant the seeds for additional trips.

FIG. 3. And so, to bed. (*Courtesy of Springfield, Mo., Public Schools.*)

This class or group preparation may be developed through the use of appropriate questions, references, reports, stories, clippings, pictures, illustrations, slides, films, motion pictures, recordings, and other materials. The teacher will incite and guide discriminating discussions of the purposes, practices, materials, personnel, and other elements of the objective. Children as well as adults are always interested in other individuals and their activities, and if the destination employs a number of people, questions concerning these, their sex, age, dress, activities, general habits or manners, recreations, pay, and other personal matters and relationships may be raised. Because the purpose of this preparation is to prepare and not to fulfill, many of these items will represent questions and not answers. Probably in very few cases need there be any fear of overpreparing the group for a trip.

In this connection it is well to remember that there is a very real danger of attempting to cover too much territory on a trip. Any destination—a bank, store, museum, bridge, or boat—offers literally dozens and dozens of facts that will be intriguing to the pupils, and it will be impossible for them to see all of these adequately. Therefore, the main purpose of the trip should be pointed and specific, and attention to this purpose should be carefully maintained. Naturally, the pupils should have glimpses of these other phases because these will motivate them for later trips and additional study—the sign of a good trip. Wandering aimlessly around or exploring, either physically or mentally, will depreciate trip values. There must be a clear purpose, which all pupils understand, and also strict adherence to this purpose.[6]

Supervise the trip most carefully. The trip should be supervised most carefully in order to protect the pupil, the trip idea, and the school. The group on a trip represents the school before the world; it is in public, and many people in the vicinity are watching it, and, consequently, any boisterousness, carelessness, accident, or other unpleasantness will immediately cause adverse publicity and bring an unfavorable reaction to the school and its trips, which will seriously limit the development and utilization of this aid. The pupils must be taught to appreciate that the trip is a serious educational opportunity, not a lark or picnic. This does not mean that formal classroom discipline should prevail, but it does mean that informal good manners should be practiced.

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[6] Stenographic reports of two demonstration lessons—each in two sections, one before and one following the trip—with intermediate-grade pupils, will be found in "Proceedings of the Fourth Annual (1946) Visual Education Institute," University of Wisconsin, Madison, pp. 9–10, 61–67; 31–35, 81–86.

These undesirable possibilities can be prevented only by a proper education of the participants before the trip and a close supervision of them during it. Usually, with the average-sized and larger groups it is desirable that more than one teacher, or several carefully selected and trained older pupils, accompany it. Requiring a signed permission from the parent is a good method of ensuring protection, but it cannot take the place of vigilant and competent supervision.

✓ ***Correlate and integrate the trip with class activities.*** Although often it is possible to make profitable trips that are not related directly to curricular subjects, our interest here is in the utilization of this device as an aid to formal instruction. Hence, we are interested in the trips that grow directly out of school subjects or that can be closely related to, and definitely coordinated with, them. The opportunities for this correlation and integration are numerous, varied, and easy to capitalize, and increasingly they are being capitalized effectively.

Three great American educators, that is, enthusiasts for three very vigorous current educational movements, have literally jumped to capitalize on the school-trip idea. These are the audio-visual instructor, the practical educator, and the integrator. The first, as we have already seen, is enthusiastic about school trips because he recognizes in what way they can interpret, enrich, and supplement traditional school material, thus making it more vivid, intriguing, and meaningful. The practical educator supports the school trip because he recognizes that it gives the pupils useful experience with real life settings, materials, processes, and personnel. The integrator believes in breaking down the artificial lines of formal subject matter and correlating all the school's interests, subjects, activities, materials, and methods, and he promotes the trip because it does just this; it represents settings in which written and oral composition, reading, arithmetic, spelling, geography, civics, history, art, music, commerce, citizenship, courtesy, and so on, are intermingled functionally as they are in real life instead of being, as they are in the average school, separated into different subjects or "slices" of life.

It is not practicable, owing to the many possibilities and to the limitations of space, to describe all the numerous and varied potentialities of trip correlation and integration, but it is possible to illustrate a few general types. Some are as follows: using oral composition—talks, explanations, descriptions, demonstrations, and dramatizations—both in class or group and in assembly, PTA, and other public meetings in preparing for, and in reporting on, the trip; utilizing written composition in preparing papers, notebooks, scrapbooks, newspaper reports, and in letters of thanks and appreciation to the cooperators; building replicas of stores, banks, buildings, bridges, farms, memorials, and machines; developing exhibits of appropriate materials in connection with any subject or activity; being stimulated and inspired to creative self-expression in literature, art, music, handwork, and drawing; obtaining useful, helpful, and enriching information and knowledge in connection with all subjects; developing a broadened and improved taste for literature, music, art, and motion pictures; practicing conversation, safety, cooperation, and courtesy; realizing

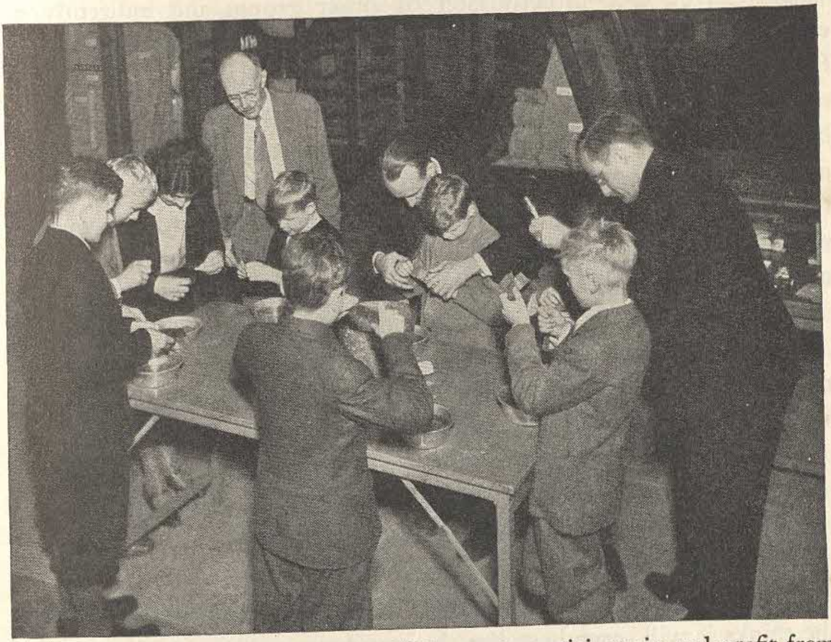

FIG. 4. Even seriously handicapped children may participate in and profit from school trips. Here blind pupils are studying silk at The Philadelphia Commercial Museum.

the parts played by skilled and unskilled labor and the implications; and appreciating the importance of the interrelationships of all of man's activities. Certainly, there is no reason why any teacher should ever complain about a lack of possibilities for a vital integration of school trips with school subjects and activities.[7]

Further, these trips may result in definite school and class projects which can be used directly later by other groups and indirectly as examples of profitable educational procedures. For instance, demands for such projects as an aquarium, vegetable and flower gardens, school museum or library, lawn beautification, window gardening, bulletin boards and materials, exhibits of toys, pets, curios, flowers, plants, photographs, and so on, and other types of projects come very naturally out of experience with these and similar items in their out-of-school settings.[8] Recommendations to the proper authorities on matters of traffic, drinking fountains, recreational facilities, welfare projects, and the like may grow easily out of investigational trips.[9]

Insofar as a particular lesson or unit of instruction is concerned, the trip should be placed where it will be most effective in furthering the associated learnings. For example, a trip might be most valuable at the beginning of a lesson or unit as a sort of preview. Or it might be used to better advantage if it were at the end as a kind of practical review, summary, or application. Or it might be scheduled in connection with some particular topic within the lesson or unit. Undoubtedly, other things being equal, the teacher will place it where she thinks it will serve best, but she may be mistaken. And she probably will be if she has never tried it elsewhere. Hence, if she is really interested in proof, she will experiment by varying its placement in later teachings. Out of such experimentation she should discover how best to capitalize on the trip with this particular subject material.

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[7] The majority of the references of this chapter include descriptions of actual practice in these correlative and integrative processes.

[8] See B. Elliott, Excursions in Appreciation in the Small Town School, "Thirteenth Yearbook," pp. 284–288, Department of Elementary School Principals, 1934, for an account of the trips taken by a four-teacher school and the interesting projects that grew out of them.

[9] The grade 9*A* class of the Mack School, Ann Arbor, Mich., following apparently useless PTA protests against the failure of traffic to observe the signs at the intersection by the school, checked traffic for three days and sent its report to the city council through the executive committee of the PTA with the result that the state highway was rerouted from this particular point.

Make and file a fair evaluation of each trip. If an educational device or opportunity is to be capitalized on successfully, the individual who does the capitalizing must have (1) a clear idea of the purposes and values involved; (2) competency in handling or utilizing the device or opportunity; and (3) a set of standards by which he can rate his results. If he has only the first two, or if he has, but does not use, the third, he can have no knowledge of the extent to which he accomplished the purpose, and hence he cannot know which parts were strong and which were weak. Similarly, with the school trip the teacher must have (1) a clear idea of purposes and values; (2) competency in planning and executing the trip; and (3) a plan by which she can estimate its success in achieving the purposes set.

Because many of these evidences of success are not immediately visible, such an evaluation is difficult, yet it must be made. Further, it must be made fairly, and not solely on the basis of the pupil's interest, or even on the teacher's for that matter. The pupils might receive a great thrill in watching the powerhouse machinery operate, the printing press turn out newspapers, or in just walking through a beautiful building, and still not receive educational value commensurate with the time and effort spent. Interest is very important, but the appraisal of the trip must also be on the basis of its success in establishing the more fundamental ideas, ideals, information, and inspiration.

The teacher may gather evidence from such sources as these: her own opinions; pupils' expressions; comments and remarks both during and following the trip (the pupils will always talk very readily about it); similar comments that come indirectly through other pupils, teachers, and parents; written pupil evaluations; requested written reports; and the records of correlated class or activity work. These appraisals are subjective in nature and may be somewhat biased and inaccurate, but they are evaluations that, taken together, will give some idea of the extent to which the trip may be considered a success.

Evaluating the various details of the trip will be a relatively easy task because of the definiteness of the things concerned. This evaluation may be made on a printed or mimeographed form, which, when completed, is filed away for reference to be used when another trip to this or a similar objective is being considered. Such questions as the following are pertinent:

1. Was the time sufficient for the trip? If too long, how much?
2. Was the group of about the proper size? If too large, how much?
3. Was the transportation or the route taken satisfactory?
4. Was the individual or group expense about right?
5. Did the group see what it went to see? If not, specify.
6. Did the group see enough to make what it saw worth while?
7. In general, was the group interested and attentive?
8. Were any pupils disappointed with the trip? Specify.
9. Were there any avoidable delays or waste of time? Specify.
10. Was the guide satisfactory? If not, specify his weaknesses.
11. Was the general conduct of the group satisfactory?
12. Was the trip correlated satisfactorily later? Specify.
13. What were the most satisfactory things about the trip?
14. What were the most unsatisfactory things about the trip?
15. If you were repeating the trip, what changes would you make?

Of course, it is entirely possible that sometimes the unsatisfactory things about the trip, such as an avoidable delay or an unsuitable guide, are due to the cooperator and not to the teacher and her group. In such instances the difficulties should be smoothed out before another trip is taken to this destination. The average cooperator, especially if he favors these trips, would be glad to make any changes that would result in a more successful event. It is the duty of the school to make sure that the event is unhandicapped in the same way that it is its duty to provide adequate heating and lighting of the classroom or appropriate textbooks and materials.[10]

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[10] An excellent Check-List for Teachers, which includes sections on Preparation, Actual Observation, Follow-Through, and Evaluation–Before and After, will be found on pp. 155–156 of Edgar Dale's book.

[11] See the footnote reference to the bibliography published by New Jersey State Teachers College, p. 247.

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13

AUDITORY AIDS

Before they became known as auditory or sound aids to instruction, the radio, phonograph, and sound-amplification and centralized sound-distribution systems were, like the stereograph and the motion picture, developed for entertainment purposes or for practical utilization in industry. It was not long until educators, encouraged by the various movements to enliven and vitalize education and substantially assisted by the manufacturers of these devices, perceived their possibilities and began to utilize them for formal instructional purposes with the result that during the past few years a great deal of school money and time have been invested in them.[1] Although they have become well established in educational affairs, they promise still greater development as refinements and adaptations are made and as teachers and administrators become more skillful in utilizing them. The purpose of this chapter is to describe these devices and to show some of the ways in which they can be profitably capitalized in educational settings.[2]

RADIO

If the motion picture has reached its millions through the theater, the radio has influenced its tens of millions in the home. Approximately eighty-five per cent of the American people spend some time each day listening to the radio.[3] Within a generation it has developed from a "gadget" into a household necessity. According to the Public Affairs Committee (see footnote, p. 292), the public now spends $632,000,000 a year on radio, and advertisers spend $397,000,000 on broadcasting; the companies spend $300,000,000 for broadcasting and make $90,000,000 profit, which means that for every dollar the public spends, it receives 50 cents' worth of services.[4] In any case, today radio is recognized as one of the most vital implements in the shaping and molding of public opinion. Recent developments in FM (frequency modulation) broadcasting, television, and facsimile broadcasting, as well as instantaneous recording and reproduction of programs and other material, have extended the possibilities of use and usefulness of this type of instructional device, not only outside the school but also inside it.

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[1] For example, the Westinghouse Electric Company recently reported that about 1,350,000 pupils in 2,700 private, public, and parochial schools participated in some 900 educational programs conducted by six of its stations during the 1947–1948 school year. These figures represent almost a 100 per cent increase over the previous year.

[2] For a discussion of the use of radio in another type of educational setting, see E. C. Parker, E. Inman, and R. Snyder, "Religious Radio: What to Do and How," Harper & Brothers, New York, 1947.

The children in the public schools of today have been brought up in the age of radio. In fact, many of them are listening to their favorite programs long before they are old enough to attend school. After starting to school, they will still spend considerable time each day listening to the programs of their choice. And one must concede there is a wide variation in types of program to which they can listen. Although many of these programs are not suitable for classroom use, some of them are, and many others have been developed especially for the school setting. Before the close of the First World War many educators recognized the educational potential of this new medium of communication and began planning for its use. The University of Wisconsin broadcast its first program in 1917. This station, WHA, is the oldest educational radio station in the United States. During the next decade over one hundred educational institutions started their own stations.[5] Then came a period of rapid decline. Today there are not more than thirty or thirty-five of these stations in operation.[6] It is interesting to note that as the number of stations operated by universities declined, the number operated by boards of education in the larger cities increased.

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[3] In June, 1948, the Broadcast Measurement Bureau estimated the number of "radio homes" as 37,623,000 or 94.2 per cent of all American homes. According to *Newsweek*, vol. 32, p. 45, Dec. 27, 1948, there were 75,000,000 radio sets then in use, the year's production being 16,000,000 sets.

[4] There are many well-informed individuals who are of the opinion that, judging by the quality of the programs broadcast, this is too great a profit.

[5] At the present time more than 600 colleges and universities in the United States are offering courses in radio production and management. A few of them, the University of Denver, for example, offer a four-year curriculum in professional radio training. Still more of them schedule two-to-four-week radio clinics and workshops for teachers, professionals, and others interested in the field.

One of the chief reasons for this rapid decrease in the number of educational broadcasting stations was the operating expense. This increased materially as these stations tried to compete with the commercial broadcasts. There was also the problem of providing suitable programs. At first the faculty members and students welcomed the opportunity "to go on the air," but before long most of them felt that their audience was not of sufficient size to justify the time spent in preparation. Probably they were right because only a few schools owned receiving sets and because the programs presented did not correlate with the classwork. Further, during this period commercial companies became interested in the radio as a means of advertising. Larger and more powerful stations were developed. Schools that wished to listen to the educational programs could not because the smaller stations were crowded out.

Frequency-modulation broadcasting offers the schools a second chance to operate stations for educational purposes. According to the Federal Communications Commission, 20 channels, each 200 kilocycles wide, from 84 to 88 megacycles, will be allocated for educational stations. Among others the boards of education in San Francisco, Detroit,[7] Santa Monica, Chicago, Urbana, Newark, Floral Park, New York, and Cleveland are now operating FM stations.[8] The ever-increasing number of applications for licenses indicates a revival of interest in the establishment of educational broadcasting stations.

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[6] According to a letter from the Federal Communications Commission, Washington, D.C., Apr. 12, 1948, the number of educational broadcasting stations, AM and FM, is 13 licensed, 30 authorized, plus 6 applications.

[7] In Detroit, where the public school system operates FM station WDTR, the Department of Radio Education is a regular department in the Division of Instruction. The usual high-school credit is given for work in radio classes. In addition to the courses, a Saturday Morning Workshop is provided for students desiring extra training. In 1948, 12,000 students visited the local broadcasting stations.

[8] This list of cities was taken from a mimeographed report, No. 19856 of the Federal Communications Commission, Mar. 26, 1948. The report also lists 30 cities that have been authorized to operate FM stations and 6 that have made application.

A recent change in FM rules makes it possible for school stations to go on the air with power as low as from five or ten watts instead of the former requirements of 250 watts or more. One low-watt station is now operating at Syracuse University. Covering a 3-mile area around the campus, such a transmitter can be installed for about $2,500. Of course, educational stations are concerned with the broadcasting of much more than just classroom broadcasts; in fact, some of them broadcast no classroom programs. Here again, programs will not be used unless they are planned and presented to correlate with the classroom work and contribute to the over-all educational objectives.

Advantages of the radio. Like the other devices discussed in the preceding chapters the radio—sometimes called the "Fourth R"—has certain advantages that justify its place in the audio-visual program. The most important of these advantages are the following:

1. Radio Reflects On-the-Spot Current Events. This advantage is well known because nearly everyone at some time or other has listened in for a special event—the inauguration of a president, the reading of a decision by the Supreme Court, a detailed description of a catastrophe, a football game, a parade, or some similar event of national interest.

2. It Brings a Sense of Participation. The person who listens to a stirring address or to a vivid description of some event as it unfolds comes to feel that he is actually a member of the audience or a participator in the event.

3. It Appeals to the Emotions. The radio program must hold its audience. Dramatic appeal to the emotions through the actors themselves or through appropriate music and sound effects is provided in order to attract and hold attention. This dramatic appeal is very important in developing and molding attitudes. For example, a statement of basic facts concerning juvenile delinquency is not nearly so effective as the dramatization of actual cases.

4. It is Inexpensive. Because the programs are free, the radio is one type of audio-visual device that can be considered in terms of the cost of the machine only. The only expense is the provision of sufficient receiving sets to adequately meet the needs of the school.

5. Radio Brings Authority. The radio can bring into the classroom as teachers the statesmen, scientists, news analysts, health specialists, and other leading authorities of the nation.

6. It Eliminates Distance. Distance is no longer a limiting factor in communications by radio. Only a few months ago millions of people throughout the world listened to the roar of the atomic bomb and a vivid description of the test in the South Pacific. Thus radio provides a ringside seat at any event on the globe.

FIG. 1. A group of interested elementary-school listeners. (*Courtesy of Detroit Public Schools.*)

7. *It Adds Variety to the Classroom Procedure.* As suggested above, listening to radio is different from the usual classroom routines and hence brings interesting variety.

8. Radio is Adapted to Group Instruction. It can be used for school groups of any size from a small class to the entire student body.

Limitations of the radio. Although the radio is recognized as a dynamic teaching tool there are certain factors that limit its more extensive use.

1. Lack of a Sufficient Number of Receiving Sets to Meet the Needs of the Staff. Radio programs are free, but obviously they cannot be utilized unless they can be received. The use of portable radios and a centralized sound system are two approaches to the solution of this problem. However, as yet only a few schools have adequate equipment.[9]

2. Timing the Radio Broadcast with the Class Schedule. This has always been a major problem. The program may not be available when school is in session. Even if it is available in one part of the country, it may not be available in another because of the four-hour difference in time from coast to coast. Further, even if it is available during school hours, it may not be available at the time a particular class meets. Also the instructor who is teaching several classes in the same subject will rarely be able to use the program with more than one class and thus will hesitate to use it at all.

The possibilities of this limitation can be and are being overcome by (1) recording and reproducing the program during the school hours by state and local stations and (2) wire or paper tape recording by the local school. In the latter case the teacher can then use the program when needed, and she can use it as often as necessary.

Objectives of radio instruction. Although there are many purposes, both general and specific, that can be set as justifiable objectives of the pupil's experiences with radio programs, an adequate discussion of these would require many more pages than are available here. Consequently, only three will be presented. The first of these concerns very directly the utilization of radio as an important audio aid, and the two others, although closely related, are a bit broader in general characteristics and implications.

To Interpret and Enrich Classroom Work. This purpose is not peculiar to radio instruction only; it is common to all the instructional aids discussed in this book, and, therefore, it need not be discussed at length in this connection. Radio instruction is not a substitute for teacher instruction, nor will it ever become one, as some skeptical educators claim to believe. Rather it is a means of supplementing, vitalizing, correlating, and often modernizing and decrystallizing the material of the textbook. Specially designed programs of high instructional value are broadcast by regional and national networks—commercialized, noncommercialized, and strictly educational. In order to make for a more complete and profitable use of these programs, quite a number of the stations and sources supply inexpensive teachers' manuals and guides, suggestions, annotated bibliographies, printed transcripts and summaries, and other materials. A few examples will illustrate how the radio program can, and actually does, function. Not all the program series indicated are available during school hours, but, as will be suggested later, they all can be used in connection with schoolwork.

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[9] With the new types of battery-portable radio, which play for 300 hours, even the rural schools can develop good listening utilization.

An item in the *Audio-Visual Guide,* December, 1947, states that every sixth-, seventh-, and eighth-grade classroom in Rochester, N.Y., received a table model AM-FM receiver as a gift from the local Kiwanis Club. Enlisting such support may be an admirable way to begin a program of equipment supplying, but of course it is only a beginning. Ultimately, all such equipment should be provided for out of regular school funds.

ENGLISH.[10] LITERATURE. The reading, speaking, commenting, reviewing, and dramatizing of poems, addresses, plays, pertinent news, and other literary material by well-known authors, critics, poets, playwrights, casts, and interviewers, few of whom the pupil will ever actually see, bring an emotional thrill that is rarely caused by the textbook itself. Illustrative of this type of program are "Invitation to Learning" (CBS), on which one or more of the world's great books are discussed by writers, scholars, and literary critics; "Cavalcade of America" (MBS), a dramatic presentation of famous books and American folklore; "The World's Great Novels" (NBC), which is a part of NBC's University of the Air series. Incidentally, handbooks or study guides are available from the NBC station.

COMPOSITION. Any radio program is made up of both written and oral composition. Good diction, well-chosen vocabulary, clear and concise statement, and appropriate illustration are essentials of any high-class written composition. Correct pitch, quality, rate, force, modulation, phrasing, and inflection are essentials of pleasing oral composition. Both these types of composition are represented in every attractive radio program, and both can be better understood and appreciated by the pupil through the actual illustrations that the radio offers.

Further, through the use of the radio the pupil can be taught simple production as well as consumption. He can be led to write and to present all types of radio material for real or simulated broadcasts—notes, announcements, comments, stories, reviews, poems, news reports, correspondence, interviews, and simple plays. These opportunities for pupil activity are limited in number and variety only by the range of the interests and abilities of the groups. The pupils can also be encouraged to write reviews, criticisms, reports of actual programs, letters to stations and broadcasters, and to make classified scrapbooks of material.

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[10] See Radio and English Teaching, National Council of Teachers of English, *English Monograph* No. 14, Appleton-Century-Crofts, Inc., New York, 1941, and A. P. Sterner, "Radio, Motion Picture, and Reading Interests: A Study of High School Pupils," Teachers College, Columbia University, New York, 1947.

SOCIAL SCIENCE. Radio programs reflect by news summaries, reports, comments, interpretations, explanations, descriptions, correspondence, and interviews all types of social-science settings, ancient and modern, national and international—political, industrial, civic, sociological, historical, economic, and geographical. In some of these the pupil can "see" history being actually made. Through the programs the pupil, if wisely led, not only learns facts and principles but also learns to weigh evidence, check authenticity, and to arrive at conclusions on the basis of his own thinking.

There are many excellent programs to supplement the work of the social-science class. Unfortunately, many of these are scheduled during out-of-school hours. Some of the best known programs are "America United" (NBC), on which current issues are discussed by representatives of labor unions, farm groups, and the U.S. Chamber of Commerce; "University of Chicago Round Table" (NBC), a presentation of current issues by experts and authorities. Other programs of a similar nature are "Northwestern Reviewing Stand" (MBS), "Youth Asks the Government" (ABC), "American Forum of the Air" (MBS), "Labor and the U.S.A." (ABC), "Mr. President" (ABC), and a "Report from the United Nations" (CBS).

MUSIC. These programs are effective because usually, at least, they are natural, varied, and represent a high degree of musicianship. Even a transcribed program is as accurate and nearly as intriguing as an actual broadcast. The world's most celebrated orchestras, bands, stringed ensembles, choruses, glee clubs, quartets, opera companies, and instrumental and vocal soloists—few of whom the average pupil will personally ever see or hear—are available at the simple turn of the dial of the magic box. All types and qualities of music—historical, folk, religious, dance, swing, operatic, classical, sentimental—thousands of numbers, reproduced by dozens of combinations of instruments

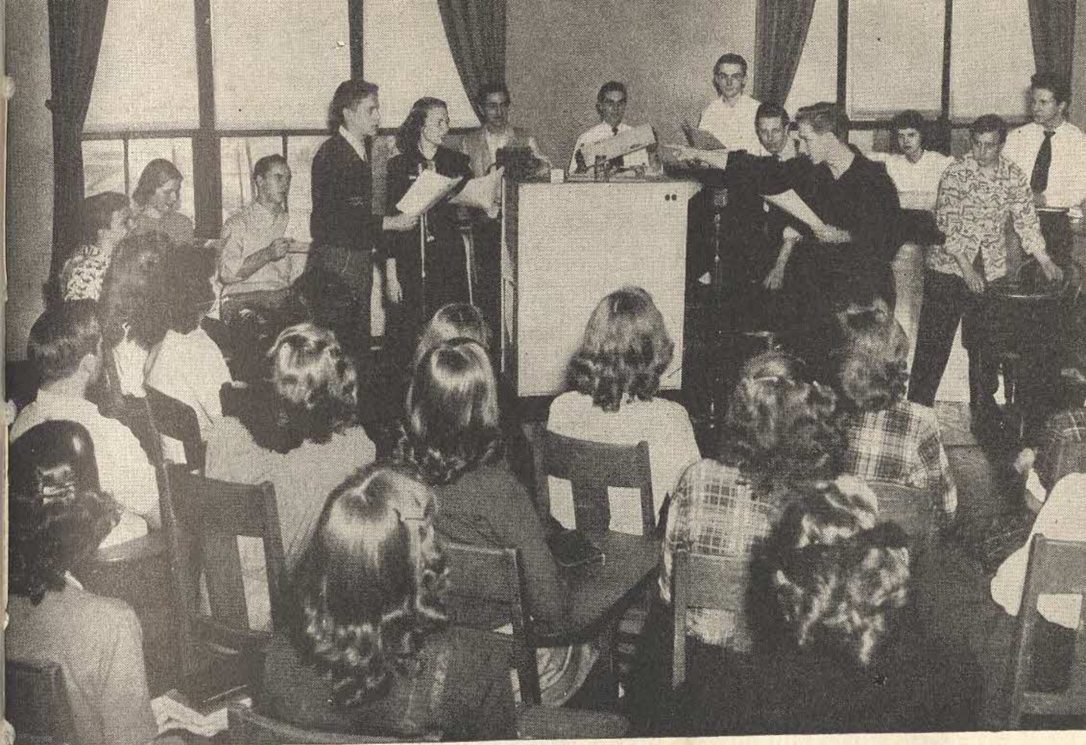

FIG. 2. A Detroit high-school radio-production class in action.

and voices, help to acquaint the pupil with the masterpieces of music and the masters of music interpretation. These can be capitalized for all types of educational purposes from pure emotional enjoyment to discriminating intellectual appreciation. Interesting and important facts about the lives of composers and artists, and historical, literary, geographical, and romantic settings are also represented in these programs. Illustrative programs are "Gateway to Music" (CBS School of the Air), "Standard School of the Air" (NBC), and "Symphonies for Youth" (MBS).

SCIENCE. Very often textbook science is somewhat behind the times because it takes several years for new discoveries, inventions, and processes to get into textbooks; radio science is up to the minute because these developments get onto the air almost immediately. Frequently, too, textbook science stops at the end of the discussion or experiment with little or no practical application. Radio science is often more useful because it must interest and, therefore, concern the people who utilize it. Good illustrations of this type of program are "The March of Science" (CBS), a new program in the American School of the Air Series and "Exploring the Unknown" (WENR), another program well suited to schoolwork. Consider for a moment how these programs can help to make science real and vital and how they elevate it from the facts-to-be-memorized and experiments-to-be-performed type of material so often mislabeled science.

GUIDANCE. In an earlier day "guidance" meant vocational guidance and little else. The newer and more logical conception is that any instruction that helps the pupil to make happy adjustments—intellectual, mental, physical, social, moral, and spiritual, as well as occupational—is guidance in a very real sense. Because it reflects all phases of man's living, the radio can exert a great influence in these varied forms of guidance. One very attractive series of programs in general guidance is "Home Is What You Make It" (NBC). This is another of the NBC University of the Air series. A good program for occupational guidance is "Choosing a Career" (American School of the Air).

These few examples indicate how the radio program can very naturally, appropriately, and effectively interpret and supplement much of the formal work of the classroom. But it can do more than this. Textbook lessons are usually academic and often unrelated to life and its realities. A carefully planned and attractively presented radio supplementation can make this textbook material the more practical by correlating and integrating it with real life settings, activities, and individuals. A symphony concert, an important address, a description of a revolutionary process or invention, or a news broadcast can help to develop wholesome citizens by teaching the pupils to understand the many and varied forms of modern problems and activities and to evaluate solutions and procedures; to recognize achievements and contributions; and to comprehend international complexities. These programs help them to think more clearly and constructively on important subjects and relationships. Of course, even intelligent thinking is not the end; it must result in intelligent acting. This should eventuate all the more easily because of the stimulation of personal interest through these mental reactions.

To Educate for Wholesome Use of Leisure. As man's working hours have steadily decreased, his hours of leisure have just as steadily increased. The ways and means of spending this leisure time, both commercialized and noncommercialized, have multiplied enormously during the past few years, and at present there appears to be no slowing down of this development. Naturally, some of these ways of spending leisure are more profitable and desirable than others. Since an individual cannot utilize all of the many and varied leisure devices available, he must make choices; and the more intelligent his selections are, the more benefit he will gain from his leisure occupations. Because the school is the only institution in the community that enrolls all the children, the implication is clear—it must accept a large share of the responsibility for helping the pupil to set, or accept, and utilize standards that will ensure the most profitable capitalization of his spare time. Briggs's simple definition of education, "To teach the pupil to do better the desirable things he is going to do anyway, and to reveal higher types of activity and make them desired and possible," applies as well to leisure training as it does to handwriting, spelling, reading, or any other phase of the work of the school.

One of the important "things that the pupil is going to do anyway" is listen to the radio. On the basis of our present knowledge and experience we have a right to assume that the average pupil will probably listen to the radio about as long as he lives. If this is true, then it logically follows that our duty is "to teach him to do radio better." Because this doing will be almost entirely voluntary on his part, it will be related to his interests. Every pupil has some interests, and these can be deepened by further experience through radio programs because they represent, directly and indirectly, just about everything in the whole world. Through radio the pupil's range of interests can be widened by experiences with things about which he knows little or nothing. In short, because of the number, variety, and quality of its representations, radio offers a most excellent device for this deepening and widening of pupil interests. Of course, this applies to his occupational as well as to his leisure-time pursuits.

To Develop Judgment and Discrimination. This objective of radio instruction is closely related to that discussed in the previous section, but it is separated here in order to emphasize it. If, as suggested above, radio reflects directly or indirectly just about everything in the whole world, then, naturally, in content (what is presented) and in performance (how content is presented) it varies in quality from bad to good, cheap to dignified, unauthentic to authentic, and undesirable to desirable. Because listening is voluntary, wise selection becomes crucial; and wise selection must be learned as it is not a trait or ability that is found in nature. If the quality of the pupil's radio consumption is to be raised, it must be raised on the basis of criteria or standards that he sincerely accepts because his listening is voluntary. These standards may be developed from evaluative discussions of real broadcasts or of simulated broadcasts by the group or by other groups.

Content. It is well known, as has been pointed out previously, that many radio programs contain much that is wholesome and uplifting; but it is also known that many of them contain much that should be considered downright insulting—trashy music, cheap "soap-serial" melodrama,[11] stupid poetry, insufferable wisecracking, meaningless quizzes, silly romances, intelligence-insulting advertising,[12] testimonials, slogans, box-top-and-wrapper "hook-the-sucker" contests and sales talk, fallacious reasonings, spurious conclusions, inaccurate or incomplete presentation of fact, unsubstantiated and glittering generalities.[13] At the other extreme there is content that is ennobling, enriching, and often sublime, of which, says the Report of the New York Regents' Inquiry, "The lamentable aspect . . . is that no very great use is being made of the superior programs."[14] And, of course, content varies in worth-whileness between these extremes.

The pupil must be taught to take a critical attitude toward radio programs—to analyze and evaluate their various elements—if he is to learn to distinguish truth from falsehood, fact from opinion, argument from ridicule, advertising from propaganda, logical from spurious reasoning, and useful material from trash. He must be taught to recognize innuendoes, insinuations, unreasonable prejudice and bias, and snap judgments. He cannot do this if the teacher does it for him even though he, for policy's sake, outwardly listens to her coercive and forbidding preaching and accepts her opinions and decisions. Criteria and standards will really become his only if he himself helps to set, or at least sincerely accepts, them. Such standards may be simple, but they must be definite. Critical but fair discussions of dishonesty, misrepresentation, high pressuring, "canned applause," testimonials, and other questionable materials or procedures as well as similar discussions of the desirable elements of programs will help to originate and develop these criteria. Writing and sending protests and favorable comments to broadcasters will help to clarify and establish them in the minds of the pupil. Broadcasters are really interested in these reactions because the success and failure of their programs depend on them. Such education will hasten the day when cheap programs are as unprofitable to the advertisers and broadcasters as they are to the listeners. Education will be more effective than censorship.[15]

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[11] According to *Fortune,* twenty million women listen each day to more than forty soap operas. The average woman listens to 5.8 of them and some listen to as many as twenty-eight. Incidentally, soap operas are not only cheap in value but are also the cheapest network shows to produce.

[12] Station KMAC broadcast 2,215 commercials in 133 hours on the air during the week beginning Jan. 21, 1945, an average of 16.7 spots per hour. More than one thousand spot announcements per week is not at all uncommon with a number of stations.

[13] A most excellent pamphlet to read in this connection is J. H. Spingarn, *Radio Is Yours,* Public Affairs Committee, Inc. (22 East 38th St., New York, 16), 1946.

[14] E. Laine, "Motion Pictures and Radio," pp. 83–84, McGraw-Hill Book Company, Inc., New York, 1938. Although this statement was made 10 years ago, there is still a great deal of truth in it.

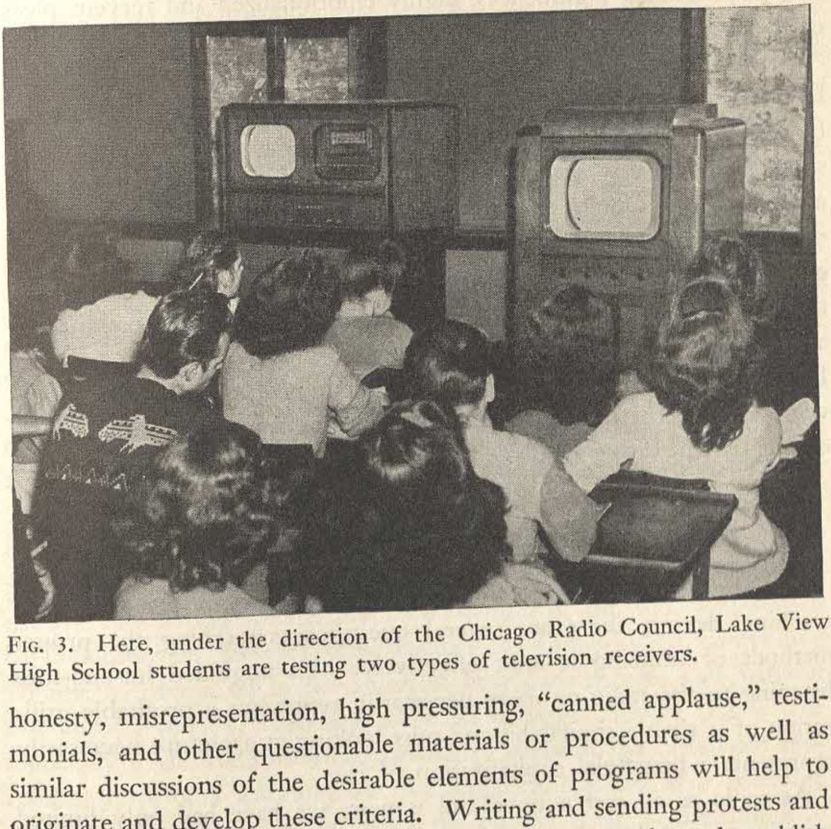

FIG. 3. Here, under the direction of the Chicago Radio Council, Lake View High School students are testing two types of television receivers.

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[15] Mrs. Helen Rachford, Audio-visual Director of the Los Angeles County Schools, has developed a monthly bulletin entitled *Listen*, which is designed to

Performance. Not only should much of the content of many radio programs be considered downright insulting; also some of the ways in which they are presented. This is true more particularly of the commercial plugs that accompany the programs than of the presentation of the programs themselves. The pupils should study these plugs to understand and appreciate the techniques and appeals being used. The overweening confidences, highly emotionalized and fervent pleas of the "rush-right-out-to-the-store-and-buy," "now-don't-forget," and "be-sure-to-tune-in-tomorrow" type, high-pressure and rapid-fire verboseness, exaggerations, and misrepresentations, few of which would be respected or permitted in or through any other advertising medium, should be critically analyzed and evaluated in order to stiffen resistance to them. One of the wonders of the age is that the businessman, who recognizes that only honest advertising brings him really intelligent and hence permanent customers, does not recognize that, by permitting such cheap methods, he is aiding and abetting commercial advertising's suicide as well as injuring, ultimately, his own business. Here again, justified and justifiable student protests will help to develop criteria for radio presentation, and inoculate against, and finally eliminate, nauseating methods from the air.[16] Hasten the day!

SUGGESTIONS FOR UTILIZING RADIO BROADCASTS

Although there is no question about the potency of the radio as a teaching device, there are several questions concerning the proper methods of utilizing it most effectively. An unguided hit-and-miss listening to the radio no more necessarily represents a profitable utilization of it than a similar hit-and-miss looking at a picture necessarily represents a beneficial capitalization of it.

As radio as an instructional aid is new, we have had only limited experience with it and, consequently, know comparatively little about the ways and means of using it most profitably. However, out of the

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improve out-of-school listening habits. It is sent home for the parents to follow along with the child.

Although the Communications Act of 1934 specifically denies the Federal Communications Commission any power of censorship, it does provide for some control through the renewal of licenses, which, as the reader probably knows, are good for only a six-month period.

[16] See footnote reference to *Radio Is Yours*, p. 292.

experimentations, investigations, and researches now being promoted all over the country by commercial and noncommercial agencies will ultimately come the techniques by which radio can be successfully evaluated. Until that time we shall have to depend on our limited experience in using radio, our knowledge of what happens in a learning situation, previous experience with somewhat similar devices, common sense, and perhaps some guesses in order to indicate what seem to be desirable teaching methods. The following suggestions appear to be reasonable.

Do not consider the broadcast a substitute for regular teaching. A radio program is an aid to teaching, not a substitute for it. It is true that during a program the class is turned over to the broadcaster but only temporarily; the teacher has the final responsibility for the instruction of the group. The radio program is, like a laboratory experiment, a trip, or a showing of slides and pictures, only an aid—a variation in teaching technique through which the regular lesson is clarified and made more vivid and vital.

If possible, avoid auditorium and other large-room settings. Generally speaking, the radio program should be received in regular classrooms because (1) these represent a normal teaching atmosphere and setting and (2) needed equipment and materials—desks, tables, maps, charts, instruments, books—are available. Although, occasionally, some particularly appropriate program may be received in the auditorium, usually this setting is unsatisfactory because of the (1) well-known bad acoustics of most of these rooms; (2) difficulty of controlling volume to permit all in the room to hear equally well and without discomfort; and (3) typical restlessness of large groups; this is true especially if the auditorium is crowded. In short, the classroom represents more of a learning, but the auditorium more of a listening, setting. A gymnasium is probably the poorest place in the school to receive radio programs.

Select programs carefully. Even though an educational program is interesting, as it should be, it is not a program of amusement or recreation; it is designed for more serious purposes. Consequently, like any other instructional material, device, or method it should be carefully selected on the basis of its probable value in furthering the child's learning. Although usually it should be closely correlated with curricular material, sometimes, as in the case of an important address, an inaugural, coronation, conference, or other outstanding event, it cannot be. Having a live radio broadcast at the exact time that a particular topic or unit is being studied is the exception rather than the rule. Correlation with the classroom work is much simpler for elementary teachers because they have the same group for the full day. Also many units extend over a period of several weeks. Where the work is departmentalized, as in the high school, definite correlation is often very difficult unless some form of recording and reproduction is used. It is well to remember that there are many excellent broadcasts that can and should be used because of their general educational value.

The radio programs that are to be used should be selected several weeks or months in advance of the time for which they are scheduled. This procedure will enable the teacher to plan better preparatory and follow-up activities.

The following criteria may be used in evaluating a broadcast:

1. Do the materials presented contribute to the attainment of the objectives of the educational program?
2. Is it authentic and accurate in all details?
3. Does it have unity?
4. Is the program suitable for the grade level for which it is being considered?
5. Will the program arouse interest and motivate the listener to read more about the subject presented?
6. Does the program summarize the main points and hence fix them in the student's mind?
7. Is the program presented in an interesting manner?
8. Does it make an emotional, as well as intellectual, appeal?
9. Is it of the right length for the listening group?

Further, the age and grade levels of the listeners must be considered. It is rarely or never possible for all the pupils from the first to the twelfth grades to benefit equally from the same program because the spread is too great. Even such topics as health and safety must be suitable for the grade levels of the listeners. In the Chicago schools the pupils are separated into four groups, (1) kindergarten, first and second grades; (2) grades three and four; (3) grades five and six; and (4) grades seven, eight, and nine. Some educators are taking the position that radio offers relatively little to the pupils of the third grade and below, but others point out that simple rhythmics, music, and specially arranged story and stunt programs are actually being used. This problem of the adaptation of programs to the various grade levels is one that is as yet unsolved. Until it is solved, the teacher who is most capable of fitting material to her purposes and classes will have to use her own best judgment in order to avoid programs that are either too simple or too complex.

Often it is hardly possible for a teacher to know exactly what a particular program will contain. However, she can check many of the available programs through the use of (1) educational bulletins published by the stations; (2) the manuals and study guides issued with a particular series; (3) radio magazines; and (4) her own and colleagues' experiences with programs and program series. Even with these precautions the teacher may frequently schedule a listening that is unsuitable. Without them she would certainly schedule a greater number of programs that are ill-fitted to her work and group.

Prepare and have the pupils prepare definitely for the broadcast. Like any other subject matter the content of a radio program is instructional material and will be more meaningful if suitable preparation for its reception is made by both teacher and pupil. This preparation supplies a basis of knowledge or information, raises important questions, indicates values and emphases, relates it to previous work, and in this way develops pupil-felt needs that it will satisfy. Naturally, if the pupils feel these lacks and anticipate having them satisfied, the broadcast will be all the more successful from both an educational and an emotional point of view. In short, the pupils should not just be allowed to listen but should be led to listen definitely for something.

This necessary preparation may be accomplished in a number of ways depending somewhat on the type of material being broadcast. Pertinent factual material about the program and its presenters, questions, problems, and references may be obtained from the broadcaster's bulletins and manuals and contributed by the teacher and her pupils. Music programs are often prepared for by a discussion of the compositions, composers, and settings, and even by playing or singing the themes. Careful attention to more or less mechanical items will enhance the value of a broadcast. The teacher should see that the radio is tuned to the desired station and should check for correct volume and tone. She should also check with the clock in order that when the radio is turned on, it is not necessary to wait for the program to come on. Students should be seated in such a way that they can hear without any difficulty. Incidentally, an important factor in the successful radio lesson is the attitude of the teacher because her attitude will be reflected by the student.

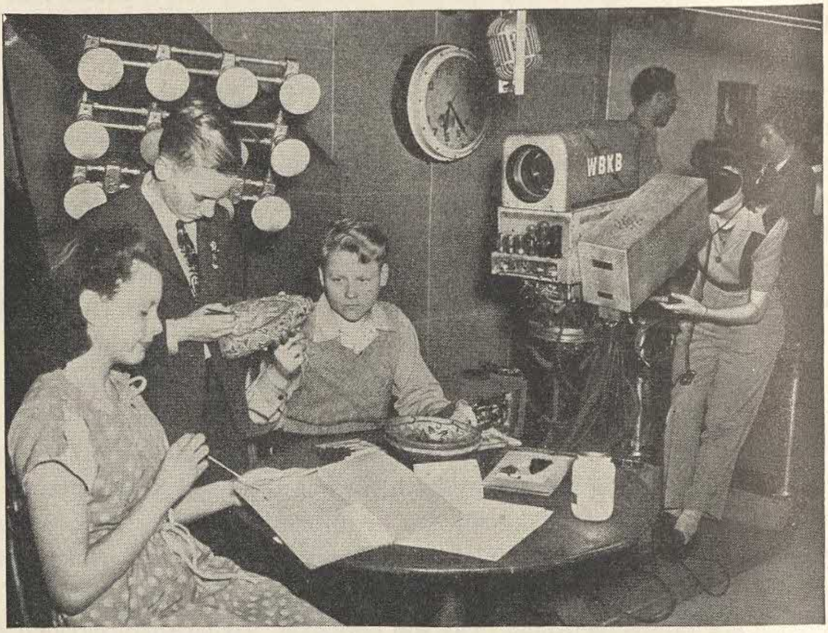

FIG. 4. Televising a hobby crafts program. (*Courtesy of Chicago Radio Council.*)

Correlate and integrate the program with classroom work. Except in unusual instances the radio program is of most benefit when used in connection with regular classroom instruction. Not only must it be selected because of its possibilities, but the teacher must make sure that it is definitely related to curricular material. Only in such a way can it be classified and justified as an audio aid. As emphasized before, this does not mean substitution for subject content.

More and more, programs are being prepared very specifically for classroom use. For instance, the reading of stories, poems, and correspondence in a foreign language, writing from dictation, answering questions put by the speaker, following on a map the trip of a traveler, reading a musical composition as it is being explained, exercising, pantomiming, and dancing to directions and music are illustrations of types of school program that are designed to be correlated closely through actual pupil activity with particular subjects. They illustrate a trend away from mere listening toward active pupil participation, thus obviating a weakness of radio instruction that has often been pointed out. Increasingly, many of these programs are being made available in transcribed form.

The teacher should insist on close attention. Probably in most instances it will not be necessary for the teacher to do this because the programs themselves are usually of sufficient interest to attract and hold attention. However, the pupil should understand that absolute silence is necessary. An explanation that a radio program is usually short and highly concentrated—a sort of brief summary in which ideas are not repeated and in which few words, phrases, and sentences are wasted—will help to prevent wandering minds. Generally speaking, the taking of notes during a short broadcast is not to be recommended because, obviously, by the time the pupil has written down one item he may have lost the two or three following points. A better plan is to have him concentrate, and, if desirable, write up his notes afterward.

If the broadcast is made before a large group, it may be necessary to prevent the confusion caused by rustling papers, dropping pencils, closing desks, talking, laughing, whispering, shuffling feet, and moving about by showing how these discourteous and inconsiderate acts distract attention. This possibility of distraction is far more possible in cases of required than in cases of voluntary attendance. Pupils who will not cooperate should be excluded from these large-group broadcasts.[17] Of course, because the pupils will usually reflect her interest and attention, the teacher herself should set the example by anticipating the program, listening closely, and showing her pleasure and enjoyment. The teacher who turns on the radio and then reads papers, computes marks, or listlessly looks out of the window in bored fashion is encouraging the pupils to do likewise, and, further, she is probably wasting a program and the pupils' time.

Wherever desirable and possible, supplement the broadcast with other aids. The radio program comes in through the sense of hearing, and if this can be supplemented with experiences through other channels, the impressions are certain to be deeper, more accurate, and more meaningful. Pictures of the content represented and its representers—slides, maps, charts, drawings, and models—as well as verbal supplementation, can be used in connection with many types of broadcast material, and these give the pupils additional slants that will help to explain and reinforce the points made in the program.

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[17] A good reference is A. P. Sterner, K. H. Saunders, and M. A. Kaplan, "Skill in Listening," National Council of Teachers of English, Chicago, 1944.

Consider the broadcast a type of assignment for further study. A good educational radio program is not something to be listened to, used once, and forgotten. Like any other instructional content some of it can probably be used, directly and indirectly, time and time again in connection with the particular subject and in other settings. In one way a good broadcast is in the nature of an assignment, which definitely indicates an important problem, provides enough material to solve it partly, stimulates the pupil to further thinking, studying, investigating, and experimenting, and indicates where other material may be found. With a number of educational broadcasts such as, for instance, "American School of the Air," "University of Chicago Round Table," and "America's Town Meeting of the Air" printed transcripts, selected bibliographies, quotations from other authorities, questions, assignments, and so on, are obtainable, and the pupils can continue their study of the implications, applications, and ramifications of the topics.

Reflect out-of-school listenings. Because (1) there are many important programs that are not broadcast during school hours; (2) not all schools and classrooms are equipped with radios; (3) radios are not possessed by all families; and (4) home listening is largely or entirely unsupervised; out-of-school listenings, both leisure-time or pure-enjoyment and school-collateral listening, corresponding to out-of-school collateral reading, should be encouraged and capitalized.[18] Particular responsibilities may be assigned to individual pupils, committees, or groups, and these can then report, interpret, review, summarize, and evaluate the programs to the entire group. Even having several pupils report on the same program will often be profitable because it brings in different points of view, different evaluations, and different emphases that may be compared or contrasted. Of course, all such assignments have real value in teaching the pupil to use his radio wisely in its natural setting. Even a general discussion of pure-enjoyment types of program can be of value in raising standards.

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[18] An interesting experiment in which the students listened to radio programs while studying is summarized in L. E. Leipold, The Radio: How Much Does It Affect Study Habits? *Clearing House,* vol. 22, pp. 78–80, October, 1947.

It is true that for some of the programs, which can be correlated but which are broadcast during out-of-school hours, it may often be impossible to make advance preparation because of inability to get details before the broadcast. In such instances the teacher and group together can guess at the purpose of the program or the questions that it is likely to answer or the points that it will probably cover, and they can list general suggestions on what to listen for. Here again, definitely listening for something is preferable to merely listening.

Attempt to measure the results of the broadcast. Obviously, it is as logical to attempt to measure the results of a broadcast as it is to attempt to measure the results of the use of any other type of teaching technique. If no measurement of outcomes is made, the teacher has no way of knowing to what extent the program represented a profitable use of her time and the pupils' time. She should have some idea of how, and of the extent to which, the broadcast influenced the pupils' thinking, added ideas or material, and developed new insights and appreciations. As has been suggested repeatedly in connection with the other aids, mere interest and attention, although basic and important, do not necessarily represent good criteria of value. Discussions, evaluations, criticisms, comments, reports, formal and informal tests, dramatizations, and even original reflections or imitations will help to appraise the value of the program.

Do not schedule too many radio programs. This is a somewhat indefinite statement because as yet no one knows just how many represents too many programs, and even this would vary with the broadcasts, schools, subjects, grade levels, and teachers' uses. There must be a limit beyond which additional programs are relatively ineffective. Too many radio programs, like too much ice cream, golf, swimming, or travel, represent tiresome and uninteresting experiences and a waste of time. The radio program is an aid to teaching; it does not represent the entire field of instructional activity. When, through repeated use, it loses its novelty and appeal, it no longer aids.

Promote the development of discrimination in listening to broadcasts. Narrowly conceived, utilizing the radio as an aid in the teaching of curricular material is largely a temporary objective because the pupil will soon be through school and therefore not be taking school subjects. Utilizing the radio by teaching a discriminating use of it is a permanent objective because the average individual will probably be listening to broadcasts all his life. This permanent objective can also be achieved to some extent because the setting is so natural and propitious. A teacher does not have to go out of her way in her attempts to accomplish it; every utilization of the radio and every discussion of a program represent material out of which a more intelligent use can be built. The pupils are led to evaluate programs, both content and performance, and thus, perhaps more or less unconsciously but nevertheless certainly, to formulate criteria or standards of radio-program consumption. It is a wise teacher who recognizes this possibility and who, easily and naturally and without sermonics, guides the pupils in the originating, developing, accepting, establishing, and utilizing of these standards.

One device that not only provides a natural setting for teaching discrimination but also a just-as-natural setting for teaching oral and written composition, as well as the material of the subjects reflected in them, is the imitative broadcast. One group plans, prepares, and rehearses its program and then during the class period broadcasts it from another room to the remainder of the class. At the end of the program the broadcasters return to the classroom, and a general discussion of the strong and weak points of the program follows.[19]

It is quite possible that within a very few years the average school will have a course, or perhaps several of them, definitely designed to teach discrimination in radio-program consumption.[20] The Radio

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[19] How one unit of an elective course, Modern Drama, was used as a setting for the preparation and actual broadcasting of a program by high-school students is described by Ruth Nethercott and Donald E. Bird in The High-school Radio Workshop, *Educational Method*, vol. 18, pp. 176–179, January, 1939. See also E. Goudy, Pupil Broadcasts as Motivation, *Clearing House*, vol. 13, pp. 349–351, February, 1939, and E. Morris, Simulated Radio, *See & Hear*, vol. 2, pp. 33–46, April, 1947. Four pertinent books are E. C. Braun and J. J. Stanley, "Let's Broadcast," The Northwestern Press, Minneapolis, 1948; A. R. Crews, "Radio Production Directing," 1944, and "Professional Radio Writing," 1946, Houghton Mifflin Company, Boston; and J. C. Waller, "The A.B.C.'s of Radio," Houghton Mifflin Company, Boston, 1946.

[20] One such course at Western High School, Detroit, is described by Arthur Stenius in Radio Units and Courses in High School, *Educational Method*, vol. 18, pp. 173–176, January, 1939. See also E. D. Child and H. R. Finch, Motion Picture and Radio: An English Elective, *Curriculum Journal*, vol. 10, pp. 253–256, October, 1939. The Weequahic High School, Newark, N.J., has a regularly credited course on photoplay and radio appreciation.

Club, now to be found in many schools, could very easily be developed into a definitely organized and properly accredited class or course. Such a course would include (1) discussions of such topics as the history and development of the radio, techniques of broadcasting, program planning and presentation, uses and utilizations, Federal administration and control, financing, advertising, broadcasting in other countries; (2) trips to broadcasting studios and stations; and (3) visits from officials, technicians, and artists. A group might even conceivably plan, build, program, and manage a school or local station in connection with some organization or institution. Although a project would offer many exploratory producing possibilities, its main emphasis would be upon the development of intelligent radio-program consumers.[21]

Inform the radio stations what classroom programs are needed. Teachers should not hesitate to let their listening needs and desires be known, not only to their local stations but also to the five national networks. These networks are commercial enterprises and as such must supply what the listeners want to hear. And they will if they know what these desires are. In fact, they want to know. Informing them of the possibilities would, in time, mean more suitable programs for classroom work. Further, the teachers can help to improve both school and home listening by constructively criticizing broadcast listening guides, which, at present, are rather poorly prepared and quite inadequate. Incidentally, teachers colleges and schools of education could do much to help by scheduling functional courses in radio for the classroom. Here again, recommendations by teachers and teacher-groups would assist in the development of such courses.

Selecting the receiving set. In comparing several different makes of receiving sets it is advisable to (1) try them in the room or rooms in which the set will be used and (2) tune all machines to the same station and then check for clarity of tone. Further, as was suggested previously in another connection, obtaining the arguments against, as well as for, each machine will provide additional information upon which to base final selection.[22]

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[21] Through the Script and Transcription Exchange of the U.S. Office of Education, Federal Security Agency, Washington, D.C., a great deal of practical and tested material, together with suggestions and directions for presentation, is available for use by schools, camps, conferences, meetings, and other educational groups and settings. Some of this material is quite appropriate for intraschool broadcasts and most of it for broadcasts by commercial and noncommercial stations. It is educational in intent and high in quality.

Sources of information on radio programs. There are numerous sources from which information regarding scheduled broadcasts may be obtained in advance. Consulting several different sources in order to plan for best utilization of the programs available is preferable to depending on one source only. The most common of these sources are the following:

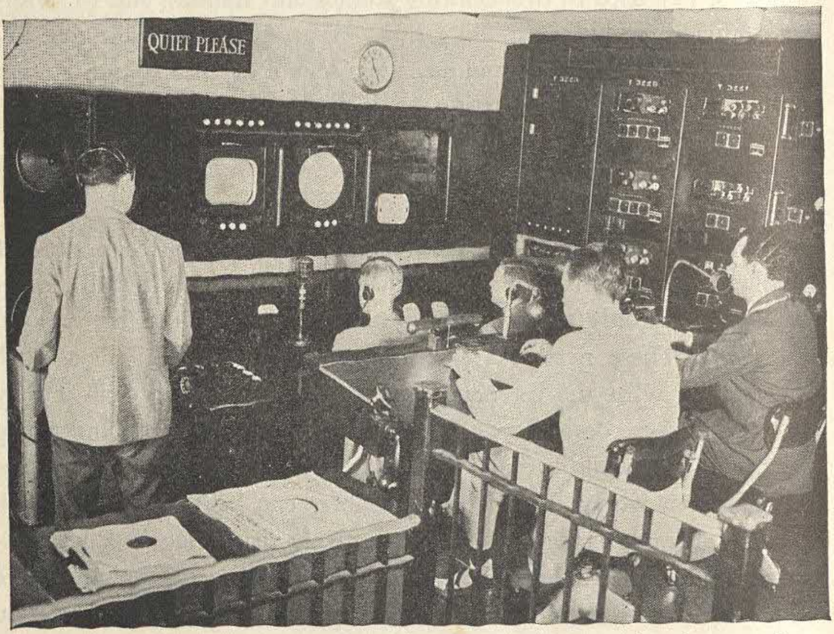

FIG. 5. A television control room. (*National Broadcasting Company.*)

1. Newspapers. Nearly all newspapers carry a daily schedule of network programs. However, this is usually only a listing with little or no descriptive data. Because it is generally a day-to-day schedule, this listing does not allow for much advance planning.

2. Local Radio Stations. Information relative to scheduled broadcasts may be obtained by writing or visiting the local station.

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[22] Basic standards to guide school officials in selecting equipment are to be found in "School Sound Systems" (1946), and "School Sound Recording and Playback Equipment" (1947), and "Classroom Radio Receivers" (1948), which were prepared by the Joint Committee on Standards for School Audio Equipment. These booklets may be obtained from the U.S. Office of Education, Washington, D.C., or the Radio Manufacturers Association.

3. *Magazines.* The *Journal of AER* (Association for Education by Radio) is published monthly during the school year. It contains a section on broadcasts for schools that is a valuable help to the teacher in selecting educational programs. *The Service Bulletin of the FREC* (Federal Radio Education Committee) is published bimonthly during the school year.

4. *Universities and State Departments.* Many universities and state departments of education operate radio stations and will send information on request. For example, the University of Illinois publishes a radio schedule for a full semester, which is mailed to all schools several days before the opening of the term.

5. *School Systems.* Several large city systems, such as Atlanta, Chicago, Cleveland, and Detroit, operate their own radio stations. The teacher or administrator can write to the board of education in nearby cities for information on available radio programs.

6. *Networks.* Some of the leading networks publish bulletins describing their programs. The Columbia Broadcasting System publishes the monthly bulletin *The CBS Listener's Guide.* The National Broadcasting Company publishes *This is the National Broadcasting Company*, a descriptive bulletin of its programs.

7. *Other Sources.* In addition to the sources listed above, pertinent information may be obtained by writing to the following:

Association for Education by Radio, 228 North La Salle St., Chicago 1, Illinois.

Federal Radio Education Committee, U.S. Office of Education, Federal Security Agency, Washington, D.C.

Institute for Education by Radio, Ohio State University, Columbus, Ohio.

National Association of Broadcasters, National Press Building, Washington, D.C.

Radio Manufacturers Association, American Building, Washington 4, D.C.

FM BROADCASTING

FM is the abbreviation for frequency modulation. Insofar as classroom use is concerned, FM has three advantages: (1) it is almost entirely free of static; (2) it can carry high-fidelity programs—more of what goes into the microphone comes out of the speaker; (3) it is free from interference from other stations.

In addition, because FM stations are much cheaper to build and equip than the AM, many schools can afford to construct their own. The following list of advantages of the school-owned FM station was taken from the *St. Louis Public School Journal*, Dorothy Blackwell, author.[23]

1. The use of radio has proved that it is essential in the maintenance of progressive and effective educational programs.
2. Radio can be a valuable aid in adult education.
3. A school-owned radio station can provide many specific educational aids. They include programs that further the objectives of the curriculum; teaching materials not available in textbooks; newscasts of current events; lectures by specialists; addresses by prominent guests; in-service teacher training; special events and community cooperative programs.
4. Students may receive technical training in radio in the school-owned station. The studios would provide a practical laboratory for the development of student talent.
5. A school-owned and operated frequency-modulation station will be a valuable aid in acquainting the public with the educational program provided for their children.
6. The school-owned station will make it possible to schedule radio programs with regular classroom work; to repeat programs when desirable; and to take advantage of educational programs available during out-of-school hours on commercial broadcasting chains.

The number of city systems, universities, and state departments of education now operating or planning to operate FM stations, seems to indicate that in time radio programs that can be correlated closely with the curriculum will be available. Through them, timing, one of the major problems mentioned previously, will be solved.[24]

TELEVISION

It is not necessary to ask how much more one would enjoy a world-series game, for example, if in addition to hearing it he could see it play by play. And television is here. It is a reality in actual life.[25] What are its educational potentialities? Although startling claims have been made concerning its possible use and influence in education, a closer examination may make one a bit skeptical of its utilization in this connection.[26]

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[23] Volume 1, no. 3, pp. 6–7, May, 1946.

[24] "FM for Education" includes suggestions for planning, licensing, and utilizing this type of broadcasting. It is issued by the U.S. Office of Education, Washington, D.C., 1945, and may be obtained from the Superintendent of Documents, U.S. Government Printing Office.

In the first place, the televised broadcast is expensive. In radio one set of technicians is required. The televised broadcast requires an elaborate camera crew. In the radio program, background and scenery are unnecessary, but in the televised broadcast these are very important. The fact that the carrier wave travels in a straight line limits the range of the televised broadcast to about fifty or seventy-five miles. Hence, on even a regional basis many stations will be needed to ensure good coverage.[27] In the second place, the present cost of the receiving set is very high. For schools that claim they have difficulty in financing radios the expense of television receivers is prohibitive.

[25] According to *Newsweek* for July 12, 1948, p. 55, "Altogether, the home owners and barflies who watched the fight (second Louis-Walcott) along with the 42,667 seat holders at Yankee Stadium totaled 6,000,000, the biggest fight audience in history." Trade authorities now estimate that there will be 12,000,000 home television receivers in use by 1952. (*Newsweek*, June 28, 1948.)

The basic principles of television were outlined by Maurice Lebano in 1880. In 1933 Vladimir Zevorykin's "iconoscope" and Philo T. Farnsworth's "image dissector" made practical applications possible. Regular transmission of television programs was inaugurated in 1936, and in 1939 the first commercial television sets were marketed. In July, 1941, the first television program was sold to a commercial sponsor by a station in New York.

The clearest explanation of television that the authors have seen is "Television," a 20-page booklet published by Transvision, Inc., New Rochelle, New York.

[26] Recently Prof. W. B. Romaine of American University completed an experiment in which elementary, high-school, and college students took a televised piano course and finished one year of lessons in 13 weeks. One lesson a week was given with no added instruction between telecasts. Not one of the 13 students had had prior vocal or instrumental lessons, the only requirement being a strong desire to learn to play the piano.

In T-V and Teen-Agers, *Educational Screen*, vol. 28, pp. 159–161, April, 1949, Philip Lewis reports the results of an inquiry conducted among 1,700 South Shore High School (Chicago) students to determine "some of the impact" of television on young people.

Television in Education, by W. H. Knowles, *School Executive*, vol. 68, pp. 46–48, March, 1949, gives a summary of what schools have done with this aid.

[27] On Aug. 9, 1948, there were only 31 commercial television stations in 20 cities of the United States. Twenty-four more were due by the end of the year. There were approximately 1,000,000 television sets in use. These sets had a price range of from $99.50 to $4,200.

In view of the above it may seem that television promises little in the field of education. However, this is not exactly true because it is now being used in some of the larger cities. Further, transcribed television is just beginning to make its appearance. Probably, if and when the cost of both programs and equipment is lowered, television will find its place in the schools.[28]

FACSIMILE BROADCASTING

In facsimile broadcasting, pictures, cartoons, and other similar printed materials are transmitted. Unlike television, since the transmitted material is reproduced on paper in the receiving set, it can be used when needed.[29] Although this method of reproducing materials may have some advantage in education, as yet it, too, is very expensive. Perhaps in time both it and television will be established in our schools.

TRANSCRIPTIONS

Transcription is the technical name for a radio program recorded on a flat wax record.[30] These records are usually 16 in. in diameter and on each side is a 15-minute program.[31] Because (1) these transcriptions are operated at a rate of 33⅓ revolutions per minute, while the ordinary phonograph operates at 78 revolutions per minute, and

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[28] For an interesting summary on the developments in television, and the possible influence of television in education see What About Television? by Paul B. Mowery, Manager of the American Broadcasting Company's Television Department, published in *The Bulletin of the National Association of Secondary-School Principals*, February, 1947. A good pro-and-con article is Television and Education, A Symposium, *Educational Screen*, vol. 28, pp. 106–111, March, 1949. Three other pertinent references are M. McClintock, What About Television?, *See & Hear*, vol. 1, pp. 57–70, October, 1945; E. Stasheff, Television, Adjunct to Present Visual Materials in Education, *See & Hear*, vol. 3, pp. 22–23, November, 1947; K. B. Haas and H. Q. Packer, "Preparation and Use of Visual Aids," Chap. 13, Prentice-Hall, Inc., New York, 1946. M. A. Gable, Teacher! Here Comes Television!, *Audio-Visual Guide*, vol. 15, pp. 16–17, March, 1949; and P. Lewis, Television Goes to School, *Educational Screen*, vol. 27, pp. 439–441, 465, November, 1948. *The Television News Letter* is published by the Association for Education by Radio, Chicago. *The Televiser* is published by Television Publications, New York.

[29] *Fax* is the name of a newspaper published twice daily by this method at the University of Miami.

[30] According to the findings of a study made by J. Wayne Wrighstone for the Ohio State Evaluation of School Broadcasts, there is no significant difference in educational effectiveness between school broadcasts direct from the radio studio and transcriptions of the same broadcasts.

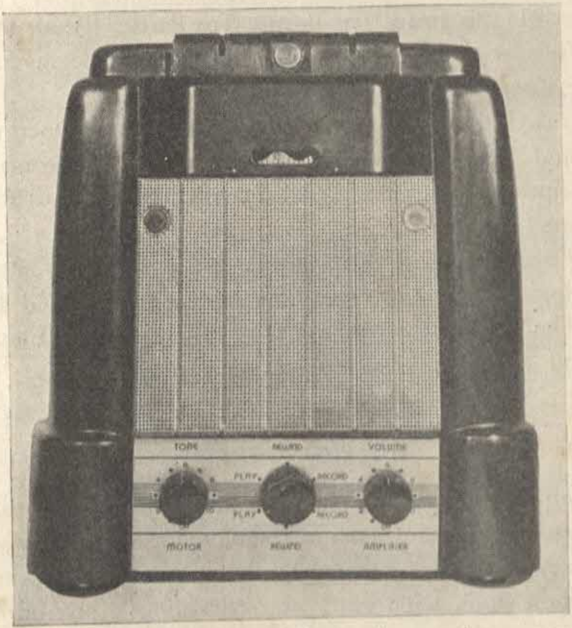

FIG. 6. This compact wire recorder will record a two-hour program. (*RCA Manufacturing Company, Inc.*)

(2) some transcriptions are now available on phonograph records, the school should be sure to select proper equipment for reproducing them.[32]

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[31] By means of microgroove recording (see One Record Holds Entire Symphony, *Life*, vol. 25, pp. 39–40, July 26, 1948) a 45-minute record is made on a 12-in. disc. These LP (Long Playing) records are played at about half the usual speed. They can be used on the regular player if it is fitted with the proper attachment. Special players are also being manufactured.

[32] The advantages of transcriptions are about the same as those of records and are discussed in the following section. A possible disadvantage—danger of breakage—is now being eliminated by the use of a plastic material called Vinylite.

Because the transcription is really a recorded broadcast, the same suggestions for evaluating and using the radio program apply equally to it. In correlating transcriptions with the educational program, "Recordings for School Use," a catalogue of appraisals by J. R. Miles, published by the World Book Company, Yonkers, New York, 1942, will be found valuable. The Record and Transcrip-

Types of transcription available. Transcriptions are available in almost every subject field and on almost every grade level from kindergarten through high school.[33] Probably the longest list is in the field of social science. The following titles indicate the type of material covered in this area: "The Boston Tea Party," "Walt Whitman," "Roger Williams and Rhode Island," "Democracy Begins at Home," "Theodore Roosevelt," and "Our Town Wakes Up."

"Thomas A. Edison," "What Price Speed," "Three Doctors Discuss Syphilis," and "Speech on Wings," are illustrative of the many excellent transcriptions in science. "The Tenth Man" is available in the field of mental hygiene.

Although space does not permit listing even a few titles in each field, the following indicate the variety of subjects: "My Old Kentucky Home," "The Last of the Mohicans," "Ivanhoe," "The Lion and the Mouse," and "Adventures of Bubble and Squash."

THE PHONOGRAPH

It is quite probable that the phonograph idea dates from the time of the Egyptian who some 3,500 years ago, according to the story, developed a device that reproduced the human voice. Another legend from a Chinese book 1,500 years later tells about a box into which a prince spoke and then sent to his friend who actually heard the message. Thomas A. Edison is usually credited with the invention of the tinfoil-cylinder machine in 1877. Five years later Alexander Graham Bell, Charles Sumner Tainter, and Chicester A. Bell invented the wax-cylinder method of recording and a machine that ultimately became known as the gramophone. About the same time, Edison, also working with a wax cylinder, produced the machine that later became widely known as the phonograph. Emile Berliner in 1887 developed the disc record—a zinc plate covered with an acid-resisting film. All these first models were hand driven and made use of ear tubes. Later

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tion Committee of the Association for Education by Radio is a permanently organized group that continuously evaluates classroom records. Pertinent information concerning its work can be obtained from Mrs. Gertrude Broderick, U.S. Office of Education, Washington 25, D.C. See also sources of transcriptions on p. 595.

[33] In the fall of 1948, foreign broadcasts, transcribed, were introduced as a part of the regular course material of language courses at Cornell University.

came the spring-motor and horn models. In 1925 the orthophonic victrola and the Electrola, which revolutionized both recording and playing techniques, were placed on the market and greatly popularized this form of sound transmission. Probably the phonograph was first used for teaching purposes in the public schools of Milwaukee in 1909. Since 1911, when the Victor Talking Machine Company began to develop materials for specific educational uses, this instructional aid has increased in popularity until now it is widely used.[34] In teaching music it has come to be considered indispensable.[35]

ADVANTAGES OF PHONOGRAPH RECORDS [36]

Generally speaking, nearly all the values of instruction by radio can be ascribed to instruction by phonograph records. Of course, the latter cannot bring news flashes and similar material, and perhaps they lack a bit of the atmosphere of reality that a radio program induces. However, they can bring music, addresses, textual materials, and particularized instructional lessons just as effectively as the radio and, in some instances, even more so. A brief discussion of the most important of these possibilities will indicate how a phonograph and a set of records fit into the audio-aid program.

Records can be used exactly when they are wanted. It was pointed out previously in this chapter that one serious disadvantage of the radio is that, owing to the inflexibility of school and broadcasting schedules, it is often impossible to arrange for desired listenings without disrupting the program of the school. The phonograph can be used at any time and for any length period—short, long, or medium. It can be used at the psychological moment when it is most needed and when it will be most effective in aiding instruction.

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[34] An interesting account of the "cerebrograph," a phonographlike device that teaches while the individual is asleep, will be found in *The American Magazine* for May, 1948, under the title Learn While You Sleep: Sleepeducator or Cerebrograph.

[35] The number of colleges and universities using recordings in teaching foreign languages is increasing rapidly. In these popularly called "blitz language courses" both earphones and loud-speakers are used. The more advanced students listen to broadcasts emanating from foreign countries and sent from the United States to Latin America and Europe. The Holt Spoken Language Series, which includes records for 20 different tongues, is available from Henry Holt and Company, Inc., New York. See also the references to Ault, Lamb, and von Wernsdorff on pp. 529–530.

[36] Suggestions that might be made for the utilization of records would be approximately the same as those made for the utilization of the radio on pp. 294–303, and these need not be repeated here. See also the illustrative lesson plans on pp. 325–327, 370–371, 418–420, 424–425, 457–458, 470–477, 495–496.

Records can be played more than once. The radio program is played and heard only once (unless a transcription is made), but the phonograph record can be played and heard again and again. To illustrate this advantage in music: the teacher and her pupils may prepare very intelligently for a music broadcast, but because the particular program is played but a single time, the pupils will of necessity (1) either attempt to master all the points portrayed or illustrated and as a result probably achieve learnings that are more or less scattered or (2) give special attention to certain items and, consequently, underemphasize or miss others.

FIG. 7. This attractive elementary-school records library provides for instant accessibility as well as suitable protection. (*RCA Victor.*)

With the phonograph record this is different. It may be played several times, the pupils listening each time with a different purpose. They can listen first for a general picture or impression and then for any or all of these items: (1) the theme of the composition; (2)

changes in tempo, pitch, signature, volume, and so on; (3) phrasing and accent; and (4) the instrumentation—the contributions of the various kinds of instrument. If the pupils do not master any one of these sets of details in the first playing, the record can be played again. Further, it can be slowed down, speeded up, and even stopped at any particular point for purposes of discussion or clarification.

The teacher knows exactly what the record contains. Except in those few instances in which she has a complete script of a broadcast in advance, it is impossible for the teacher, even with the help of printed outlines, questions, problems, references, applications, suggestions, and other material to know exactly what a radio program will contain, and she is, therefore, in the position of the teacher whose preparation for a particular lesson is incomplete. When she plays a phonograph record, she knows exactly what it contains, and she can prepare her group accurately and completely for listening to it.

Phonograph records reflect a wide variety of materials. The individual who considers phonograph records to be representations of music only knows very little about this type of audio aid. It is true that music does represent the greatest area in which records have been made; and hundreds of new records, not only of music programs and of individual and group music lessons but also of music integrated with various other subjects, are being constantly turned out. At the same time, many other fields of education are also represented by, and through, phonograph records. As a matter of fact, these records are now being used in connection with all or nearly all school subjects: in dancing, rhythmics, marching, and other forms of physical education; in all forms of English and especially in literature, dramatics, and oral composition;[37] in spelling, arithmetic, geography, and health;

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[37] For example, Harper & Brothers publish a combination of the Mercury Shakespeare textbooks and the Mercury Text Records. The student may listen to "The Merchant of Venice," "Twelfth Night," "Julius Caesar," or "Macbeth" being played just as the Mercury Theater Acting Company would produce it on the stage. Orson Welles's own stage directions are an integral part of the book, keeping the student constantly aware of the action that takes place on the stage. Down the outside margin of each page appear Welles's pen-and-ink drawings, visualizing stage settings, costume, and make-up in most vivid fashion. Thus Shakespeare is fully enjoyed, not merely read.

Life Dramatizations of Distinguished Americans is a new recorded series by The School Guild Theater, distributed by Training Aids, Inc., Los Angeles. Each recording is a complete teaching unit, contained on two sides of a 16-in. tranin foreign languages; in penmanship, shorthand, and typewriting; and in natural and social-science courses. They are being used successfully in work with students who are hard of hearing and those with speech defects. The supply of thousands and thousands of records is being continuously augmented as educators and manufacturers cooperate in developing materials needed.

Records are inexpensive. The average 16-in. transcription contains material for about one-half hour of playing—15 minutes on each side. The initial cost of these records is not great, and when it is remembered that they can be used time and again, the per-playing cost of each is very small. It is just as logical for a school to build up a library of records as it is to build up a library of books, pictures, films, slides, specimens, or models. By adding two or three dozen carefully selected records each year, any school can soon have a transcription library of real merit. The phonograph itself may vary in cost from a few dollars to several hundred, but because it is comparatively simple and contains few working parts and thus should last a long time, it, too, represents really only a nominal expenditure; and its upkeep expense is practically nil.

Records can be made and used. Because it is now possible for the school to make some of its own records and transcriptions, a brief description of the three types of recording equipment available is pertinent here.[38]

Disc recorder. This type of recorder is one of the oldest and is similar to those used in making records for phonographs. The sound is recorded on an acetate disc, which can be replayed immediately. These discs vary in size from 6 to 16 in. With careful handling a record will last for at least fifty playbacks.

The outstanding advantage of this type of recorder is that it can be used to keep a record of the students' progress in speech, reading, and so on, and also similar records of improvement of special groups or classes.

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scription. Each unit includes an introduction for the teacher—suggestions for use, background material, and so on—pre-listening activities for the students, a 15-minute drama, follow-up suggestions, and a "built-in," teacher-student listening guide.

[38] A good article describing representative types and makes of audio equipment is A Brief Survey of Currently Available Audio Equipment by K. A. Barleben, *Audio-Visual Guide,* vol. 14, March, pp. 7–12, May, pp. 5–10, 1948. Future articles are planned to keep this information up to date.

These machines are rather heavy. Other disadvantages are found in the possibilities of damaged records through a faulty needle or careless operation, failure to remove the wax thread as it is cut from the record, and the necessity for changing the discs every 15 minutes.

Tape and wire recorders. These machines record the sound on magnetic tape or wire. They are smaller and more portable than the disc recorder. They can record a program ranging from a few minutes to as much as eight hours without interruption and will last almost indefinitely. The wire or tape can be cut and edited, thereby eliminating undesirable portions. The reels of tape or wire require little space for storage. Because the sound is recorded magnetically, it is reproduced without anything touching the wire or tape. Hence there is little or no danger of damage, and longer life is assured.

Before selecting a recorder the user should know how and where it is to be used and then have the various types and makes demonstrated.[39]

Probably one of the most important uses of the recorder is to record a radio program, thus making it available for use when needed. Inexpensive radio tuners, which eliminate the use of the microphone and thus do away with extraneous noises, including speaker and amplifier deficiencies, are now available. The recorder can also be used for group improvement. A band, a glee club, or similar group can hear itself as others hear it. The instructor can point out errors and possibilities for improvement. Similarly, the recorder can be used for individual improvement in music or speechwork. In speech correction such common errors as incorrect phrasing, long pauses, unnecessary words, and repetitions are easily noted, and the student can work for improvement.

SOUND AMPLIFICATION

The general school assembly, which has become an important educational setting, is now capitalized in a great variety of ways by both student and outside speakers, musicians, and dramatists. However, in many instances assembly presentations are handicapped because of the poor acoustics of the auditorium. Apparently, in the planning and building of many school auditoriums, beauty and seating capacity are considered first, last, and all the time, and acoustics rarely or never. The inevitable result of a combination of poor acoustics and the natural restlessness of the average pupil at an unsuccessful presentation is even worse when the gymnasium is used for auditorium purposes.

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[39] For a comparison of the different recorders, prices, and so on, see The Sound Recorder Parade by William J. Temple, *Senior Scholastic*, Mar. 1, 1948, pp. 18*T*–20*T*. See also W. J. Elliott, Throw Away Those Discs, *Library Journal*, May 15, 1948.

Sound amplification, the purpose of which is to increase the volume in order that music, addresses, and dramatizations can be easily heard in the farthermost parts of the room, can often help to remedy this bad situation. Naturally, the disadvantage of this system is that the pupils who are seated in the more favorably located sections of the auditorium may be handicapped in their listening because the sound is too loud. However, a comparison of the relative advantages and disadvantages of nonamplification and amplification in an auditorium poorly designed acoustically, favors the latter plan. In addition to being used in the auditorium, amplifying systems are frequently used in the gymnasium in connection with basketball games and physical-education exhibitions, on the athletic field and playground in connection with football games and other events, and on the street in advertising campaigns of various sorts. In all these settings sound amplification is really an instructional aid.

Amplification equipment ranges in size and cost from that which is small, portable, and relatively inexpensive to that which is permanently fixed and much more complicated and expensive. Nearly all these types of equipment are designed and constructed in such a way that with few changes and at small cost they can be used to reproduce phonograph records, transcriptions, and even radio broadcasts. The most highly developed type of amplification equipment is that usually designated as "centralized sound distribution," discussed below.

CENTRALIZED SOUND DISTRIBUTION

The centralized sound-distribution system is constructed to send material—notices, announcements, directions, dramatizations, music, debates, addresses, radio programs, records and transcriptions—from the office or other centrally located room to any room or rooms in the building. The most desirable, and the most expensive, of this equipment is selective, that is, it can carry different material to different rooms at the same time, without interference between these distributions and without interference with the activities in the rooms to which no material is sent. This device, too, can be classed as a potentially important auditory aid.

The advantages of centralized sound distribution are numerous and probably obvious. Among the most important are that notices, announcements, and directions, sent directly and not by messengers, reach all parts of the building at the same time; a great variety of material can be definitely capitalized by the proper groups without disrupting the other classes or the school; students may receive actual practice in speaking into a microphone in a natural radio setting; an assembly program can be sent to the entire school irrespective of the seating capacity of the auditorium; and general programs on health, safety, citizenship, and other drives can be brought to any section of the school, or to the entire school. The common objection to the use of this equipment is that it will be abused; that the frequent interruption of class or study session by routine notices, announcements, directions, exhortations, programs, and whatnots will be disconcerting, to say the least, to the teacher and her pupils. However, whether or not this is a valid objection depends on the use made of the system and not on the system itself.

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[40] Sound is a regular monthly section on radio and recordings in *See & Hear* magazine. Other pertinent material may be obtained from the Association for Education by Radio, 228 North LaSalle St., Chicago 1; Bureau of Educational Research, The Ohio State University, Columbus, Ohio; U.S. Office of Education, Washington, D.C.; National Committee on Education by Radio, 1 Madison Ave., New York; Federal Radio Education Committee, Washington, D.C.; and Educational Department, National Association of Broadcasters, Washington, D.C. See also the references to sources on pp. 593–594.

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[41] Records Children Like is a regular monthly section of *Parents' Magazine*. Records on Review is a regular department of *Educational Screen*.

See also footnote 32, p. 309, on classroom record evaluation. The references on p. 311 reflect the use of recordings in connection with school subjects.

14

USING AUDIO-VISUAL AIDS IN THE PRIMARY GRADES[1]

COME AND CLIMB

To the thousands of children who each year come for the first time to the open doors of schools, the invitation is given to come and climb. Climb the educational ladder and live more fully and completely by growing physically, emotionally, socially, and academically through a series of happy and gradually developing experiences. School curricula offer opportunities to fulfill this invitation and develop abilities to satisfy individual and social demands.

This chapter suggests experiences for the primary round of the educational ladder. This first round must be strong and well shaped with learning experiences to provide a successful beginning to the gradual round-by-round climb, a climb that must be happy and interesting, with sufficient academic growth to attain a satisfying goal.

In this chapter the first group of activities is planned for a unit of work in social studies. With the farm as the central topic and employing a wide variety of audio-visual aids and capitalizing pupil experience and interest, this unit assumes a correlated and rounded shape by promoting a complete language arts program. In it the pupil not only looks and listens but he also talks, dramatizes, sketches, makes models, and in other ways contributes substantially to the lessons. In learning about the farm he learns language easily and naturally. The second group of activities, composed of individual lessons built around story, number, and reading exercises, is planned to promote and to give special basic needs necessary in the fundamental process of learning.

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[1] Prepared by Elizabeth Bloss, Primary Instructor, C. M. Bardwell School, Aurora, Ill.

All experiences undertaken are of such a nature as to fit the level of achievement and the maturity of primary children.

By the correct utilization of audio-visual materials specific objectives are more readily attained, and the learning situations take on interest, meaning, and understanding. Outcomes are more effective because of the vicarious experiences of seeing-hearing-doing-thinking-learning.

With such opportunities as suggested in the following procedures, progress is made up the ladder, round by round, to a goal every child has a right to desire and achieve.

THE FARM

Animals have a strong appeal to primary children. Beginning with this known fact, one can encourage interest and develop it into a study to enrich and enlarge their experiences. Concrete information can be gained by planning many seeing and hearing opportunities which involve real animals, people, and things.

PLANNING PROCEDURE

I. Objectives established to gain desired learning results

A. General: To provide concrete experiences which will give a general knowledge and appreciation of farm life.

B. Specific:

1. To acquaint the child with farm animals
2. To help him become more familiar with the value of farm animals
3. To develop an appreciation of the care farm animals require
4. To instill in the mind of the child a complete picture of a farm as a whole, with an understanding of what a farm consists of and a general knowledge of all work involved
5. To impress upon the child the necessity of farms for world livelihood
6. To develop the ability to obtain independent information
7. To enrich the oral vocabulary of each child
8. To promote opportunity for pupil participation and cooperation

II. Audio-visual aids. Because of content the aids were selected and integrated with the unit of study. All aids can be repeated, as often as desired, in the various phases of the unit of study.

1. *Educational motion-picture film:* "Farm Animals"
   - Blackboard
   - Bulletin board display
   - Chart
2. *Records:* "Uncle Don on the Farm"
   - Flat pictures
   - Flash cards
   - Blackboard
   - Chart
3. *Educational motion-picture film:* "Poultry on the Farm"
   - Flat pictures
   - Flash cards
   - Blackboard
   - Chart
4. *Filmstrips:* "I Live in the Country," "I Live in the City"
   - Doll dressing
   - Clay modeling
   - Soap modeling
   - Papier mâché
   - Blackboard sketch
   - Construction of farm buildings from boxes, paper, and so on
5. *Opaque projection:* "Farm Pictures"
   - Flat pictures
   - Scrapbook
6. *Trips:*
   - Blackboard
   - Objects, models, specimens
   - Table display and captions
   - Map
   - Drawings
7. *Dramatization:* radio and television
   - Radio-television apparatus
   - Characters in costume
   - Play in action
8. *Correlated activities:*
   - Books
   - Models, objects, specimens
   - Drawings
   - Plants
   - Sound movie
   - Slides
   - Table arrangements
   - Scrapbooks

TEACHING PROCEDURE

I. Educational motion-picture film: "Farm Animals"[2]

A. Purpose: To work toward objective results and to stimulate an interest in farm life which will give pleasure and will result in further study.

B. Motivation: Two methods of arousing interest and extending the desire to learn

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[2] B&W sound, 11 min.; Encyclopaedia Britannica Films Inc., Wilmette, Ill.

1. Riddles. Prepare simple riddles about the cow, horse, pig, goat, and sheep, such as, for example:

   "Ma-a, ma-a!
   I have horns.
   I can butt.
   What am I?"

   Have the riddles written on the blackboard or on charts. As each is read, the answer is written on the blackboard. Discuss the animals in general and, if possible, have the suggestions come from the children that the farm would be the logical place to find these animals.

2. Poems. Poetry can be utilized and given a special use, and children like to hear poems about friends on the farm. "Familiar Friends" by James S. Tippett is a good selection.

   "The horses, the pigs,
   And the chickens,
   The turkeys, the ducks,
   And the sheep!
   I can see all my friends
   From my window
   As soon as I waken
   From sleep. . . ."

   Read the poem once for enjoyment. Then reread and have a child point to each animal as it is mentioned in the poem. Flat pictures for this purpose should be arranged as a bulletin board display. The poem and display can be a lead to an interesting discussion of farm friends.

C. Presentation of the film: Make the child aware of the contents to be seen and then show the film.

<table>
<tr><td colspan="5">Farm Animals</td></tr>
<tr><td>cow</td><td>horse</td><td>pig</td><td>goat</td><td>sheep</td></tr>
<tr><td colspan="5">1. What is the name of the mother animal?
2. What is the name of the baby animal?
3. What does the animal eat?
4. What care does the farmer give the animal?
5. Of what use is the animal to the farmer?</td></tr>
</table>

1. Arrange a chart on the blackboard to secure the specific information to be learned from the film.

   In order that each child may feel his need for alertness and participation, give each a special duty. Appoint five committees; one for each animal. Call them the pig committee, cow committee, and so on. Each member of the class is on one of the five committees, and it is his responsibility to learn about his animal.

   Relate to the class that you are going to take them on a visit to a farm by showing them a motion-picture film. Suggest that if they use their eyes and ears well, they will find the answers to all the questions in the chart.
2. Show the film without comment.

D. *Clarify and develop:* Satisfactory results are obtained by planned clarifying techniques.

1. Discuss the chart of questions by means of committee response.
2. To make immediate use of vocabulary knowledge, have a vocabulary word list on the blackboard: milking machine, cow, calf, mare, sow, colt, kid, cud, lamb, hayloft, harness, windmill, skim milk, pasture, scales, bridle, curry, hoof, shears, bit.

   Permit a child to go to the board, erase a word, pronounce it, tell where he saw it in the film, and use it in a sentence. Do each word in like manner.
3. The same word list can be used to play "Puzzle." Write the statements and sentences on the blackboard. The following are illustrative.

FIND MY MISSING WORD

The farmer used ______ to cut the wool from the sheep.

A ______ is part of a horse's bridle.

______ are used to pump water.

Words from the list are used to complete the sentences.

E. *Motion-picture films for additional subject matter:*[3]

Goats
Horse
Shep—The Farm Dog
Spring on the Farm
Summer on the Farm
Autumn on the Farm
Winter on the Farm
The Farm (silent)

II. Records:

Uncle Don on the Farm (two-disc, four parts)
The Farmer Man Song and My Dog Stubby

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[3] Encyclopaedia Britannica Films Inc., Wilmette, Ill.

Lambs, Hen–Rooster, Turkey
Horse, Cat, Cow
Duckling, Frog, Pig

A. Purpose: By the time activities created by the use of the film are completed, the children have a good beginning in getting acquainted with farm animals and their home, the farm. Their knowledge just acquired can take on a real and living quality through an experience in which animal sounds are introduced. Records bring this presentation to the classroom. These records will further promote unit objectives and present animal sounds to awaken and cultivate a listening interest.

B. Motivation: Use a simple technique to center attention on the activity to be presented.

1. Flat pictures. Arrange a bulletin board with pictures of farm animals. Use this caption:

   Name us.
   Can you talk animal talk?
   What do we say?

   Discuss the bulletin board display, and give the children the opportunity to imitate the talk of the various animals. This is an interesting way of giving living quality to the subject matter.

C. Presentation of the Record: Present only one side of a disc at a given period. The following activity is planned for Horse, Cat, and Cow.

1. Tell the children that they have had fun trying to talk animal talk, and they are now going with Uncle Don, by means of a record, to hear the real talk of the horse and cow. Direct the group to notice the sounds of the animals and to listen closely to Uncle Don, and they will be able to interpret the animal sounds.
2. Play the disc through the first time without interruptions.

D. Note the listening alertness: This is extremely important to develop ear attention. Since the first playing was mostly for enjoyment, let the children, in their own free speaking, discuss the animal sounds. If not brought out in the conversation, they must be guided to interpret the horse and cow talk as given by Uncle Don. Before the presentation they were directed to listen for that one point of interest.

E. *Second playing:* If span of attention and interest is as desired, the replaying may take place during a single period. However, it is preferably done during another activity period.

Focus attention on more specific learnings. Make the following chart on the blackboard.

Cow

1. For what do we thank the cow each day?
2. From what does the cow make milk?

Horse

1. What does the horse want for dinner?

Point out to the children that, in order for them to become better acquainted with the horse and cow, you are going to replay the disc. Assist their listening by having them obtain the answers to the questions in the above chart.

F. *Clarify the second playing:* Keep interest alive with quick-moving techniques. Results can be clarified by means of a game. Have the children sit in a circle. One child may be a cow and stand in the center. He may call for the answer to the first question in this manner, "Moo, moo, I am a cow. For what do you thank me? The first child in the circle to answer "butter," "cheese," or "milk" may go to the center. He asks the second question. "Moo, moo, I am a cow. From what do I make milk?" Continue the game as long as there is interest. Learning is going on through effective repetition.

The other three parts of the records "Uncle Don on the Farm" should be presented in similar manner. The children enjoy hearing the records again and again. They soon learn the songs and gain much pleasure by singing with Uncle Don.

G. *Records for additional pleasure and study*

Barnyard Friends–Listen and Color (Musicolor Record Co., New York)
Ducklings on Parade (RCA Victor)
The Sheep and Pig Who Set Up Housekeeping (RCA Victor)
What the Turkey Said (RCA Victor)
The Little Farmer (RCA Victor)
The Unlucky Farmer (RCA Victor)

III. Educational motion-picture film: "Poultry on the Farm"[4]

A. Purpose: Experiences with the songs of Uncle Don about the duckling, rooster, hen, and turkey give rise to an interest in feathered friends of the farm. This interest should be captivated into teaching poultry types and fundamental facts about each type. Help can be obtained from a motion-picture film on this subject.

B. Motivation: To focus interest on poultry, integrate a poem with flat pictures. Have an arrangement of four flat pictures—ducks, geese, turkeys, and chickens. Also have the names printed on 2½ by 6 in. oak tags to be used in flash card style. Read the following poem through once for enjoyment.

FEATHERED FRIENDS

"Listen closely, friends of mine,
And see if you can find the line,
That will quickly, surely let you know
As we meet our farm friends—here we go!

"Our first friend looks so very trim
'Cause he has just enjoyed a swim.
His legs are short, his bill is flat.
He even waddles, imagine that!

"Our next friend has a spreading tail
His legs are strong but rather frail.
He gobbles and spreads his wings as he may
But his life is not safe on Thanksgiving Day!

"He looks like a duck, but his neck is longer
He says, 'Hiss, Hiss' and is very much stronger
He has web-feet and a flat bill too
And he likes to swim, oh yes, that's true.

"Our last friend is a common bird
Whose 'cackling' I'm sure you must have heard.
She pecks around the yard all day,
Then in her nest, an egg she'll lay."

—Dorothy Landry

Ask the children if the poem does not remind them of riddles. Reread and this time stop at the end of the second, third, fourth, and fifth verses to permit a child to find the card with the name of the feathered friend on it and hold it under the correct picture. This procedure is not only enjoyable, but also a learning process of associating a printed word with a picture of what it means.

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[4] B&W sound, 11 min.; Encyclopaedia Britannica Films Inc., Wilmette, Ill.

C. *Presentation of the film:* Make ready for learnings desired and then show the film.

1. Arrange a chart on the blackboard to point out important information to be obtained.

Chickens

1. How do they eat and drink?
2. From where does the baby chick come?

Ducks

1. Tell all about the duck's feet and for what they are used.
2. Where and how does mother duck get her food?

Geese

1. What are the babies called?
2. What do they have for their dinner?

Turkeys

1. What is father turkey called?
2. Where do the turkeys sleep?

Remind the pupils that while they are visiting with their feathered friends, they must remember to find the answers to the questions in the chart.

2. Show the film without comment.

D. *Clarify the showing:* Techniques to hold interest and test knowledge gained.

1. What is poultry? Write the word on the blackboard. Let the answer be given by having the children find and hold before the class the cards with the words "ducks," "geese," "turkeys," "chickens." Then let them again place the words under the picture arrangement. Also, write the words on the blackboard under poultry. This again is good word, picture, and meaning association.
2. Answer the questions in the chart. Have the children sit in a group and discuss the questions in conversational manner. Besides enriching their knowledge of feathered friends, this provides an excellent opportunity for oral language development.

3. Vocabulary bee: Choose sides and in spelling-bee fashion see which side can use the most vocabulary words in correct sentences. Write each word on the board as it is said so the written word and the correct pronunciation will be associated. Word list: roosting, incubator, paddles, webbed feet, poultry, brooder house, roosts, gander, gosling, scoops, trough, turkey cock, ridges. Have a second screening and show the part on chickens, stopping the projector and discussing chickens quite completely. Then similarly show and discuss the part on ducks, and so on.

E. *Motion-picture films for additional use:*

Coronet Instructional Films

- Let's Visit a Poultry Farm
- The Dairy Farm

Encyclopaedia Britannica Films Inc.

- Autumn on the Farm
- Winter on the Farm
- Spring on the Farm
- Summer on the Farm
- Three Little Kittens (also in filmstrip)
- Goats (also in filmstrip)
- The Horse (also in filmstrip)
- Shep—The Farm Dog (also in filmstrip)

IV. Filmstrips:[5] "I Live in the Country," "I Live in the City"

1. *Purpose:* By this time several of the experiences suggested at the end of this unit to correlate the study with all classroom activities should be getting into construction. For instance, the children should now be able to start work on the frieze of farm life and the miniature farm. The filmstrip "I Live in the Country" can be used to stimulate thinking in the planning and arrangement of farm buildings, crops, pastures, and so on.
2. *Motivation:* To develop and direct interest toward the lesson to be taught.

An unusually pleasant experience can be enjoyed by having the children dress dolls to represent the farmer and his wife, and to make farm animals. Girls, as a general rule, wish to dress the dolls. The boys have fun making the animals.

The farmer and his wife can be small dolls with typical American farm costumes made of cloth, crepe paper, or colored construction paper. In like manner, clothespins can be very cleverly dressed to represent characters. Paper dolls cut and dressed are also interesting.

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[5] Row, Peterson and Company, Evanston, Ill.

Animals can be modeled from clay or soap or made of papier mâché. Pipe cleaners, also, can be shaped into representative animal forms.

In this work the children are having the opportunity of expressing their thoughts and feelings through the use of their hands. Let them know that the results of their work—the farmer, his wife, and the animals—are essential to a farm. State that you are going to show them a textfilm on living in the country, and they can see for themselves the importance of the characters.

3. *Teaching the textfilm:* The children should freely discuss each frame, and be permitted to relate any personal experience that seeing the picture may bring to their minds. The teacher, as a leader, must be alert to making suggestions and raising questions. Bring out the work of the farmer, his family, and the animals; also, the arrangement or setting of the complete farm. For example, the first five frames may be explained as follows:

This picture tells who is the most important on the farm. Look and name them. Let's watch and see why they are important. What is the farmer's wife holding? Where do you suppose she got the vegetables in the basket? (Farm garden.) See the shocks of grain. What could they be? (Oats or wheat.) Name some things that might be made from oats or wheat. (Oatmeal, wheat cereal, bread, and so on.) (Fig. 1.)

Here we have some important buildings on the farm. Find and name them. (Cattle barn, silo, tool shed.) What field can be seen? (Cornfield.) Why is corn important? (Corn cereal, corn bread, corn meal, and so on.) (Fig. 2.)

Now we see one important kind of farm animal. (Name and discuss. Talk about cows and the meaning of cattle. Talk about the lane and discuss the difference between this lane and a lane on the highway or in the city streets.) (Fig. 3.)

Perhaps we could call this picture the home of the cows. Each cow has a place of its own. What is it called? (Stall.) Also discuss how each cow has his own salt and drinking cup.) (Fig. 4.)

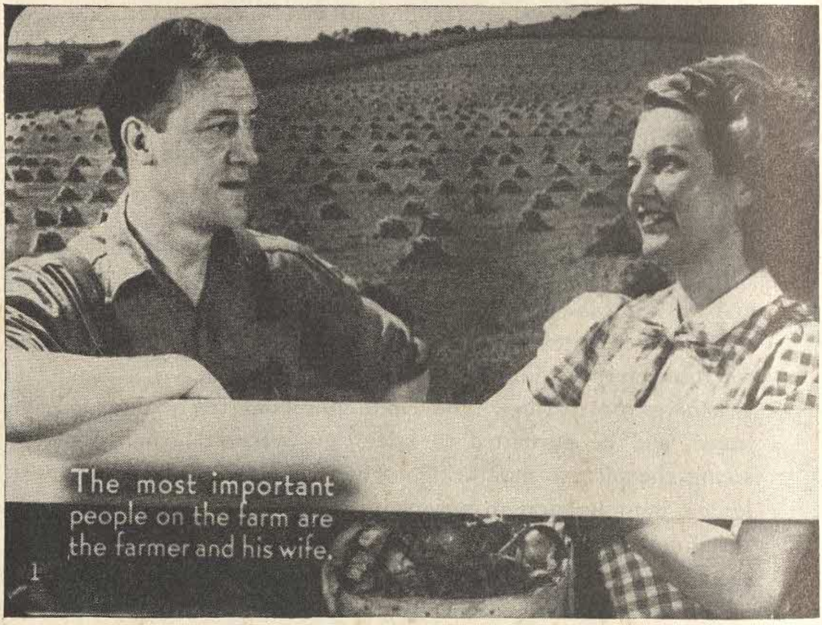
The most important people on the farm are the farmer and his wife.
1

FIG. 1. The most important people.

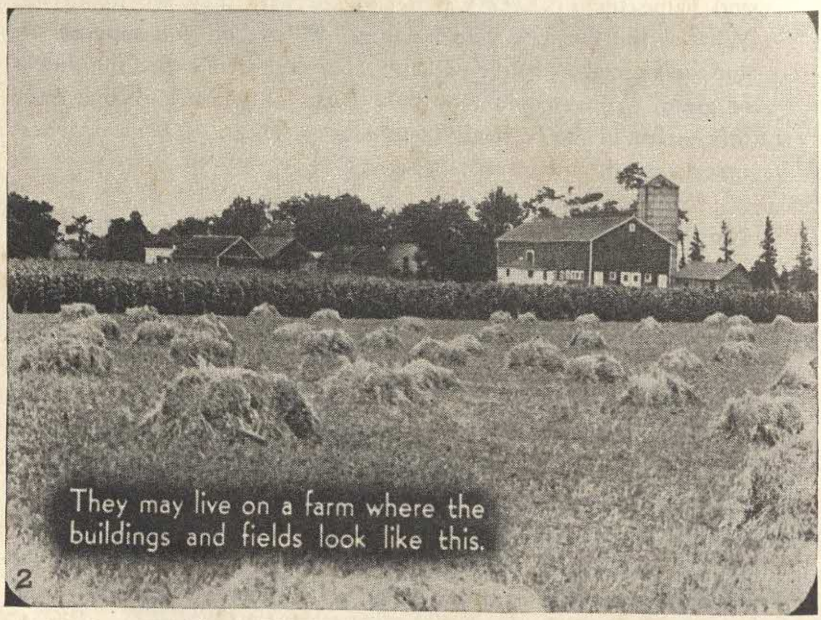
They may live on a farm where the buildings and fields look like this.
2

FIG. 2. Here's where they live and work.

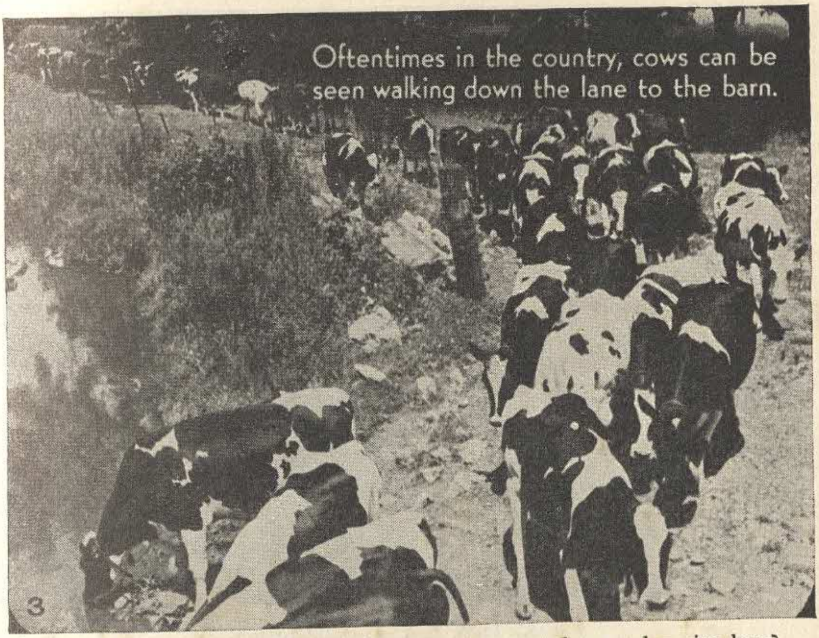
Oftentimes in the country, cows can be seen walking down the lane to the barn.
3

FIG. 3. What's the difference between a country lane and a city lane?

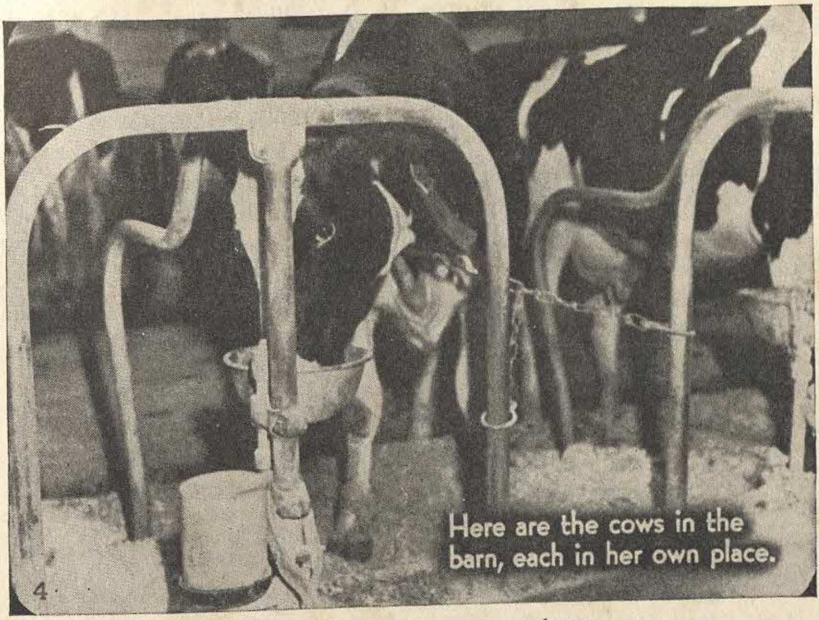

FIG. 4. The cows are now at home.

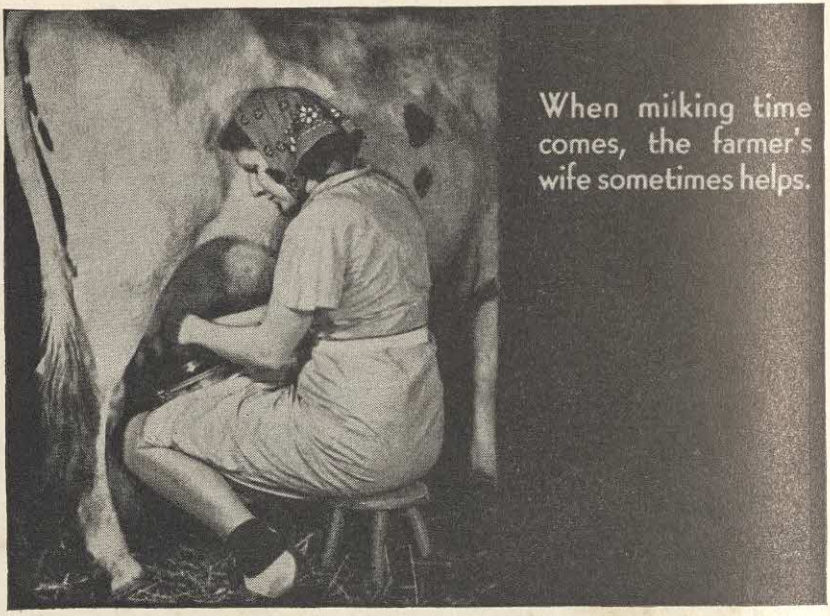
When milking time comes, the farmer's wife sometimes helps.

FIG. 5. Here is one of the reasons.

You can now see one of the many reasons why the farmer's wife is important. Count the legs on the milking stool. What is she putting the milk in? (Milking pail.) (Fig. 5.)

This suggested pattern can be followed throughout the use of the textfilm. For best results show only a few frames at each given period.

4. *Clarify:* Make immediate use of the textfilm experience.

As a group, sketch a picture of a complete farm on the blackboard. This is done very simply with chalk, giving several children an opportunity to express their ideas through drawing. As the sketching is in progress, carry on a discussion to bring about application of things learned in the textfilm. For example:

What is a silo?
What is put in the silo?
Of what is silage made?
Where shall we place the silo in the picture?
Why would that be a good location?
Where shall we have the farmer's house? Why?
The cornfield?
And so on.

After the farm has been planned and arranged in the drawing on the blackboard, the children are better prepared to work in small groups on the frieze of farm life and the miniature farm on the floor. Use animals, the farmer, his wife, and children. Have them doing something. This will add life and activity, and give that feeling of reality and homelike atmosphere.

5. *A comparison:* To stimulate thinking in terms of likenesses and differences.

During the study of life on the farm, attention should be called to life in the city. By showing the textfilm, "I Live in the City," the children can be made conscious of the likenesses and differences in city and country life, but at the same time they can be shown the necessity of each way of living to provide a balanced nation.

Examples with suggested items for comparison:

FRAME 1

In the city many people live in apartment houses.
What is an apartment house?
Why are such buildings necessary?
Compare an apartment house with a farmhouse.
Likeness: each is a happy home, if made so.

FRAME 11

Compare the cow lane through the pasture with the city traffic lanes.
Where are the cars going?
Point out differences in ways of city people and country people going to work.
Likeness: each lane is satisfactory for its purpose.

FRAME 18

Many city people work in factories.
Discuss what is meant by a factory and factory work.
Specify some things made in a factory.
Point out difference in country work and city work.
Likeness: both are necessary for maintenance of life. In what ways?

This activity is significant in that it makes clear and understandable the two prominent ways of American living—country life and city life. The children are also developing abilities to think, evaluate, and exchange comparative thoughts.

6. *Filmstrips to promote additional learnings:*
   Encyclopaedia Britannica Films Inc.
      The Horse
      Goats
   Popular Science Publishing Co., Inc.
      Visiting the Farm

V. Opaque projector: Activity on flat pictures about the farm.

1. *Purpose:* When children are interested in a piece of work, they immediately take an active part in its development and wish to be helpful and contribute. Because flat pictures are attractive and appeal to children and are also easily secured, many are usually brought into the schoolroom. To give the pupils a feeling of importance in the project, their contributions should be used. Therefore, the purpose of this lesson is to set up a satisfactory learning situation with the flat picture collection.
2. *Picture contributions and reports:* With the use of an opaque projector each child should be given the opportunity to have his farm picture flashed on the screen. He should then, in his free, expressive way, be permitted to interpret his thoughts of the picture to his classmates.

   Comments from the teacher about various pictures can help the children connect what they are seeing with past and present experiences of the farm.

   A group period such as this gives training in oral language development, poise, attentiveness, and respect to classmate speakers.
3. *Utilization of pictures:* The pictures contributed by the children and used in the opaque projector for reports can serve further usefulness in a scrapbook activity. The entire room can participate in its making.

   Give every child a sheet of 18- by 25-in. manila paper. Direct and assist each one to title his page, properly mount his picture, and write a three- or four-sentence story about the picture. Then arrange the pages, make an attractive cover, and bind or tie them into a large scrapbook. Print on the cover OUR FARM BOOK.

   Through this accomplishment the children have been given another enjoyable and enriched activity, which has also provided extended experience in picture interpretation and written language development.

VI. Trip: Visit a typical farm.

1. *Purpose:* Learning experiences have now developed to the extent where they need to be clinched and made a part of real living.

The children should be given the opportunity to observe natural colors, touch for real live feeling, and to truly see farm life as learned through the other teaching mediums. A trip to a nearby farm is a valuable means of obtaining this concrete process through observation.

2. *Planning:* Plan the tour with the children. Here the teacher should act only as a guide. The children plan what they wish to see and do, and this gives them a sense of responsibility and independence.

First, make a list on the blackboard of things the group wishes to see on the farm. Each child will desire to see those things which captivated his interest during the various phases of the farm study. Also, during the past study, there may have been questions encountered which during this visit can be completely clarified. Example of list and questions:

Things We Wish to See

Four-legged Animals	Poultry	Buildings	Other Things
cow horse pig goat sheep	ducks turkeys geese chickens	house barn (stall) hayloft corncrib silo chicken house sheep shelter milk house and so on	farmer farmer's wife pasture corn hay oats tractor wagon milking machine harness scales cow lane eggs and so on

Questions We Wish to Answer

1. How does the farmer husk his corn?
2. Where do the ducks and geese sleep?
3. And so on.

Each child should be assigned two things, from the list and the questions, for which he is fully responsible. It will be his duty to find out about them and to report to the group upon his return.

The teacher should make the trip first to avoid difficulties that might arise. If the distance is not too great, a small committee of children should go along to observe the route to be taken. This committee can then aid the group in sketching a map on the blackboard or on wrapping paper. The route of travel should be marked from the school to the farm and back. Name the streets used in leaving the city and make drawings of various points of interest along the way—such as a big maple tree near a curve, a bridge, buildings, a railroad track along the highway, and so on. The map should be studied and used as a guide on the tour.

If any financing is necessary, it should be handled by a committee of children, thus giving opportunity for development in a study of money. Their duties would be keeping a record of pupils paying, an account of the money taken in, and being responsible for paying the group's expenses to the bus officials or other individuals.

3. *Observation:* Take the tour as planned, but be alert for unplanned situations. Opportunities could arise whereby learnings might be obtained that were unforeseen and did not come out in the planning. For instance, comments made by the farmer or the showing of farm implements are apt to add a new interest among the children. Advantage should be taken of all interests, planned or unplanned, so as much as possible can be gained from the tour.

Just before leaving, read the following poem for enjoyment.

FARM LIFE

"I love to go see Aunt Flo
And chase her old fat hen
That wobbles all around the yard
Again and then again!

"I love to watch the piggies eat
And hear the horses neigh
And run the little calves a race
And slide down stacks of hay.

"And when I'm dusted up a lot
And sort of skinned my knees,

I like to go inside and rest,
And have some cottage cheese."
—Ruth Edna Stanton

4. *Suggested ideas:* After the tour, classroom activities must be of such a nature as to test the children on their seeing, hearing, touching, and real life experience.
    a. Conversation period. Give ample time for comments and reports on the two following questions.

    Did we see what we had listed in our chart?
    Did we find answers to our questions?

    b. Apply learnings. The visit to the farm may give the children new thoughts as to their miniature farm project and frieze. These should be discussed and the children given time to make improvements.

    c. Table display. Arrange a table with this caption.

    We belong on the farm.
    Name us.
    Tell one sentence about us.

    The children bring articles for the table that have reference to the farm, such as raw wool, egg, chicken feather, duck down, oats, horeshoe, and so on. Here the children are learning to contribute and to share materials and information with classmates.

    d. Letters. As an activity in social training and written language development, "thank-you" letters should be written to those who assisted in making the tour a success.

VII. Dramatization in a radio and television activity

1. *Purpose:* There is a need in primary work to assist children to grow in the ability to express ideas and feelings, exchange ideas, and to give each child a feeling of security and confidence. With this in view and with recognition of the value of dramatization for this purpose, the study of the farm can come to an enjoyable close through this medium of instruction worked out in a well-planned radio and television activity.
2. *Planning:* To promote cooperation and group initiative have the children work in committees.

    As a room committee, plan and write a story or poem to be dramatized.

Have various committees perform the following duties: choose the characters, plan the costumes, arrange the program, direct the practicing, make the equipment, and set the stage.

The dramatization can be worked out as simply or as elaborately as desired. The real values do not come from costuming, staging, and so on, but from working together, writing the story, making the preparations, and experiencing pleasure in "make believing" or imitating.

3. *Radio and television program:* To be given before an audience of children in the primary and intermediate grades.

Station: Use station identifications to fit the group, the time, and place of giving.

Come on the air with a group of eight children standing in the background singing "Moo, Moo Cow" (learned from the records, "Uncle Don on the Farm").

As the music fades away and the group steps out of view, two boys, dressed as twins, appear and say:

> "Boys and girls, How-do-you-do!
> We have a little play for you.
> The name of it is,
> I Like the Farm—I Do!"

A narrator, not seen, slowly reads the following story. (Jimmy is seen sleeping, while children in character costume dramatize his dream. The story, itself, should suggest the scenes and acts of dramatization.)

I LIKE THE FARM—I DO!

The day had been a happy one, one that would delight any boy. Jimmy had been to the farm. With much excitement, bits of the day were told to mother as she kissed and tucked him in bed. Jimmy was tired, so very, very tired, but what fun! Yes, fun and now more fun; because Jimmy again visits the farm in a dream.

Again he saw the farmer's wife with her apron of grain. The ducks quacked excitedly as each tried to be the first to scoop up the food.

Here came the strutting turkey cock with his tail spread wide and his "gobble!" "gobble!" heard above the quacking ducks. Better luck next time, Mr. Turkey—no food left!

Oh, look! The farmer with corn and pigs! Look at them gnaw the corn off the cob. I'm glad we have better manners than pigs.

What is that noise? Look over there! Shep is teasing the sheep. See them run? Naughty Shep, you should be helping Doug, the farmer boy. Here he comes down the lane with the cow. I would like to be a farmer boy!

See that funny rooster on the fence! Why is he crowing? I thought roosters crowed to wake you up in the morning.

Just then mother came to wake Jimmy, but Jimmy was sitting straight up in bed. The rooster had done the trick.

All Jimmy could say was—Mother, the farm! It was fun! I like it—I do.

Leave the air singing the song used at the beginning and with station identification.

VIII. Suggested activities for the whole unit: Use various techniques to correlate the study with all classroom activities.

1. Start a vocabulary book, using the various word lists and writing a sentence including each word.
2. Write poems, short stories, and songs about the farm or farm animals.
3. Have children make riddles about things on the farm and let others guess.
4. Learn to spell and use words in the vocabulary lists.
5. Take every opportunity throughout the unit study to build number sense—counting cows, "Are there many farm buildings?" "I see a few ducks," and so on.
6. Give library opportunities to read books about the farm.
7. Model farm animals out of clay or with wire pipe cleaners.
8. Make a scrapbook of farm pictures. Under each write short descriptive sentences or stories.
9. Draw crayon pictures and paint pictures of the farm.
10. Make a frieze of farm life.
11. Plan and construct a miniature farm on the schoolroom floor.
12. Have a science corner and plant various grains grown on the farm. Watch and study them as they grow.
13. Plan, prepare, and present a play to children of the other rooms or to mothers of the children.
14. Hold an exhibit of the classroom activities completed.
15. Children can be responsible with reports about the various interests in the room.
16. Make slides to show at the exhibit.
17. Make a talking movie. Plan the pictures and farm scenes in roller towel arrangement. Let the children do the talking as each pic-

ture comes into view. The following poem might suggest pictures that could be used in this manner, as it is read by a narrator.

TOMMY'S DREAM

"Boys and girls, How do you do!
We have a little story for you.
It's about our little Tommy friend
So to us please, your ear do lend.

"As the sun was setting one summer's day
To bed our Tommy turned from play.
And soon he was off to that dreamy land
And dreamed a trip the angels planned.

"He saw a farm house so peaceful and bright
Where the sun was streaming with warm delight.
The fields were filled with corn, straight and tall
Soon to be harvested before the fall.

"The oats were all golden and full and ripe
To provide plenty of feed for our animals, all right!
The silo was filled with silage so green
'Twas a bumper crop if ever we'd seen.

"The barns were all spotless—for that's a must
To keep healthy cows and produce milk that's super plus!
The milking machines are quick and new
They help the farmer and save time, too.

"Then up in the barn, the hay-loft we see
To slide down the hay would fill Tommy with glee.
So he tried it—and boom! he hit the floor
Too bad, 'cause now he's awake and he dreams no more.

"Now Tommy's dream was pleasant you know
But we can relive it some day if we go
Out to the farm where life is keen
Where the air is fresh and surroundings are clean."

—Dorothy Landry

IX. ***Summary of the unit of study:*** A glance backward shows specific developments in a gradual extension of experiences to provide a rich and satisfying knowledge of a typical American farm. In the development of this unit the following procedures were used:

1. Establishing the objectives
2. Selecting the materials to be used so as to attain these objectives
3. Formulating specific procedures for each type of material used
4. Integrating all instructional materials
5. Setting up a specific procedure to develop and clarify each experience
6. Planning carry-over activities

Through such vital and enjoyable experiences, learnings are effective, and the lives of children are broadened, enriched, and made happy.

A PICTURE-STORY ACTIVITY

This lesson has been prepared to show how a filmstrip can be used during a story-telling period for enjoyment and picture-story continuity. This type of lesson is well suited for beginning first grade. Since it is based on a background of known stories, the child is likely to participate more freely, thus developing a sense of group and room security. When a child acquires the qualities of belongingness, interest, and a desire to learn, teaching becomes easy.

Subject: Literature
Grades: First and Second

Lesson: Picture-story continuity
Filmstrip: "The Pancake"[6]

PLANNING PROCEDURE

I. Objectives

A. General: To encourage child participation in story-telling

B. Specific:

1. To develop a story by picture continuity
2. To promote recognizing and recalling sequence
3. To develop the ability to name familiar stories through picture recognition
4. To promote growth in oral language
5. To encourage freedom of expression
6. To develop a desire to contribute information in group activities
7. To provide an enjoyable story-telling period, to serve as a form of relaxation from other work

II. Audio-visual aids

Filmstrip
Book jackets
Objects
Manuscripted cards
Flat pictures
Clay

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[6] Row, Peterson and Company, Evanston, Ill.

TEACHING PROCEDURE

I. Motivation: Build interest through the known. Three suggestions to recall names of storybooks are given.

1. *Bulletin-board book-jacket display.* Example: Place the following label in the center of the bulletin board.

   We are books you have read.
   Tell us our names.

   Make an arrangement of book jackets. Use familiar stories, such as:
   "Millions of Cats" (Naoma Zimmerman)
   "Tim Tadpole and the Great Bullfrog" (Marjorie Flack)
   "The Little House" (Virginia Lee Burton)
   "The Animal Way" (Jean Broadhurst)
   "White Snow, Bright Snow" (Alvin Tresselt)
   Children point to book jacket and name story it represents.

2. *Table display of objects representing familiar stories.*
   Example: Place the following label on a table.

   In what story do you find us?

   Object: A small pair of red mittens with a card by it.

   Mittens

   The child cannot read the card, but he makes a visualized connection between the object and its written name.
   Use many objects, such as:
   Three bowls of three sizes ("The Three Bears")
   Pancake or umbrella ("Little Black Sambo")
   Sack, thimble, scissors, thread ("The Little Red Hen and the Fox")
   Boy-shaped cooky ("The Gingerbread Boy")
   A bundle of sticks ("Three Little Pigs")
   A toy fire engine ("The Little Fire Engine" by Lois Lenski)
   A black toy train or engine ("The Little Train" by Lois Lenski)
   A clock with the picture of a rabbit's face pasted directly over the hands ("Telltime the Rabbit" by William Hall)
   With these, the children name a story for each object.

3. *Flat picture and riddle technique.* Use a flat picture that represents a book character. Then make up a riddle to give a hint as to the title of the book.

Examples:

Picture of a duckling: I tell the story of a little duckling whose name was Danny. He lived in a pond in the middle of a forest. The gentle breeze whispered, "Shhh! Shhh! Shhh!" What is my title? ("The Sleepy Forest," by Noama Zimmerman)

Picture of a brown horse: I tell the story of a horse who gets up at half-past four and travels all over the town. He and his master, Bill, go from door to door and never skip a single day. What is my title? ("The Horse That Takes the Milk Around," by Helen Sterling)

Picture of a black sheep dog: I tell the story of a black sheep dog who liked to push his cousins into the blackberry bushes. However, later he learned that doing nice things gave him a happy and warm feeling; so he just kept on doing them. What is my title? ("Charcoal," by Lloyd Coe)

II. **Teaching the filmstrip:** During a previous period, the story of "The Pancake" should be read to the children. They must know it well and be familiar with the way it develops. As each picture is flashed on the screen, a child tells the part of the story he sees in the picture.

Example: The story would develop something like this:

One day an old woman was making a pancake for her seven hungry children. The children said, "Hurry, Mother, we are hungry." The pancake heard them and said, "You will have to catch me before you eat me." He jumped out of the skillet. (Fig. 6.)

The pancake rolled out the door, with the old woman and the seven hungry children after him. He rolled on and on—

—until he met a man. The man said, "Good morning, Pancake."

The pancake said, "Good morning, how are you?"

"I am hungry, I want to eat you."

"No you don't, I ran away from the old woman and her seven hungry children, and I'll run away from you, too!"

He rolled on and on—

—until he met Henny Penny, and so on.

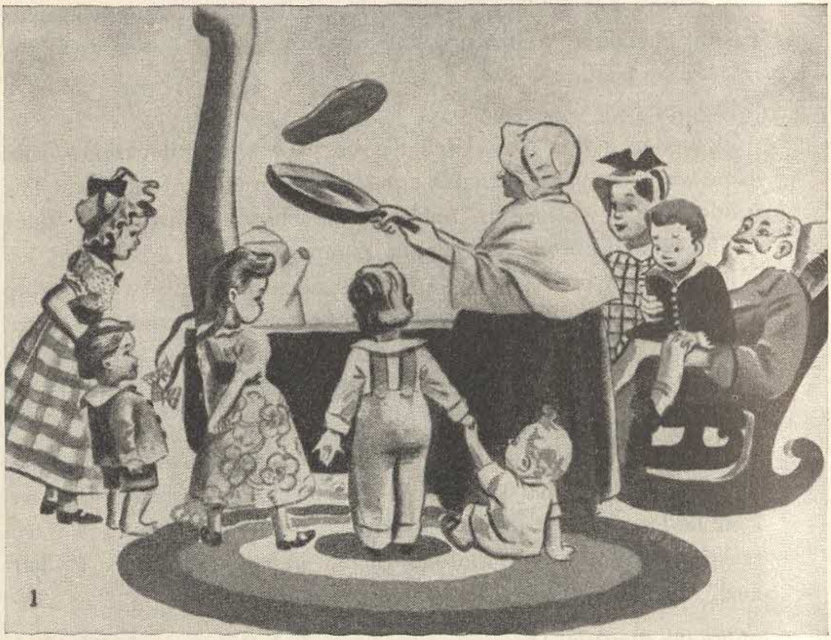

FIG. 6. The old woman was making a pancake.

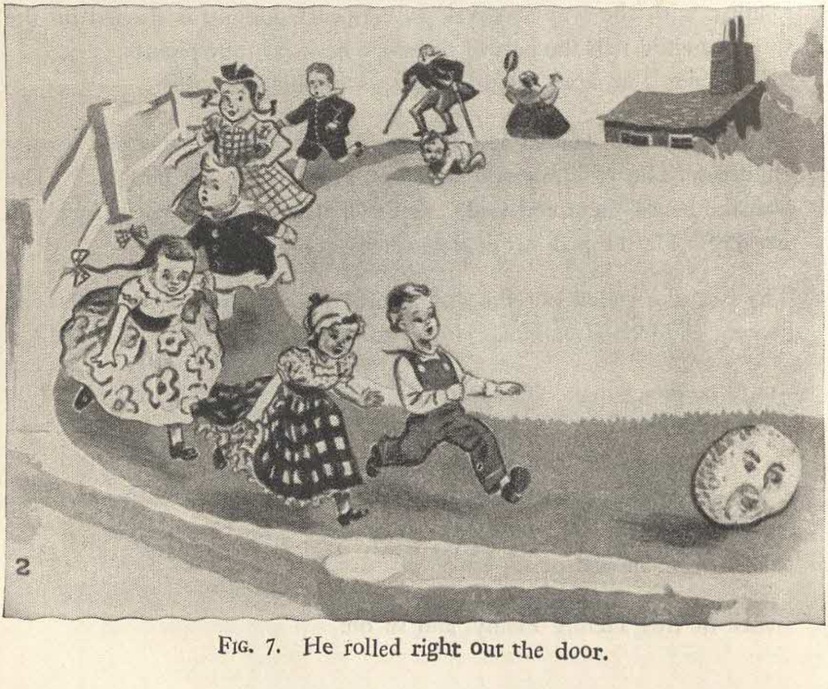

FIG. 7. He rolled right out the door.

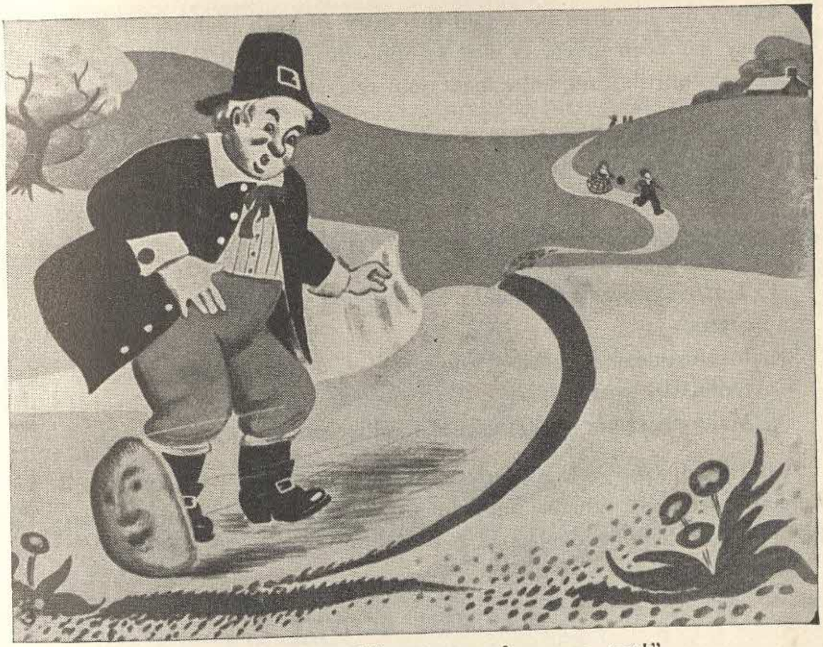

FIG. 8. ". . . and I'll run away from you, too!"

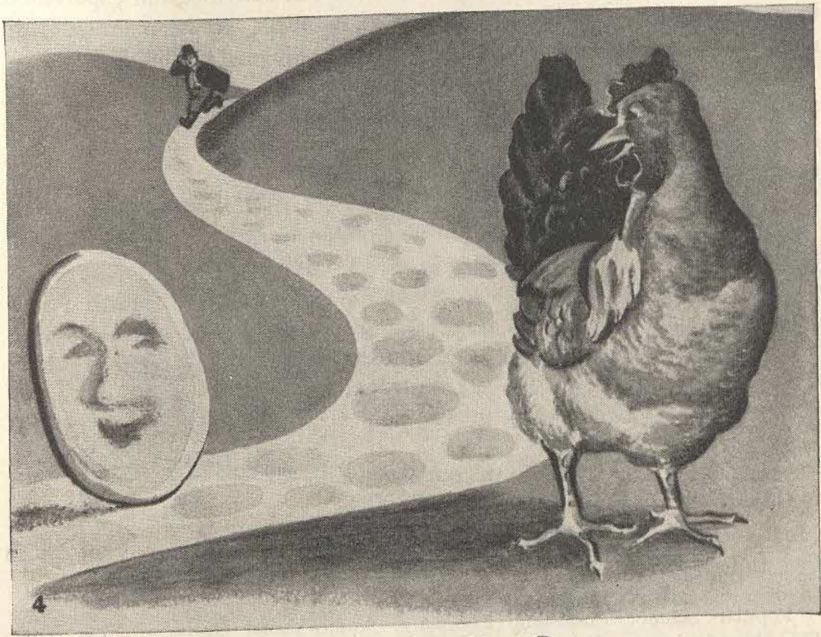

FIG. 9. Then he met Henny Penny.

When the children have told the story of each picture, the complete story has been given, as well as opportunity for oral expression, individual contribution, enjoyment, and relaxation.

III. Carry over into other interests with various follow-up activities

1. Make clay models to represent any story mentioned.
2. Draw crayon story pictures.
3. Use poster paint to make story pictures.
4. Make paper cutouts of story characters.
5. Take rhyming words and make jingling verses about stories or characters.
6. Invent guessing games—Who am I?—Character imitations.
7. Dramatize stories.
8. Make character scrapbooks of familiar stories.

A period of enjoyable pleasure, as an experience such as this gives, is not only educationally valuable but is long remembered and becomes one of the highlights of happily developed personalities.

A NUMBER ACTIVITY

Primary arithmetic should consist of numerous activities and experiences to arouse interest in, and require the use of, numbers. In this manner, arithmetic becomes meaningful, understandable, and essential to children.

The following is written for the teaching of addition combinations. With the help of various visual aids, it is easy for the children to interpret the basic number facts.

Subject: Numbers *Grade:* Second

Lesson: Addition Combinations

$$\begin{array}{cccccc} 3 & 4 & 2 & 5 & 1 & 6 \\ 4 & 3 & 5 & 2 & 6 & 1 \\ \hline 7 & 7 & 7 & 7 & 7 & 7 \end{array}$$

Filmstrip: "Number Family in Addition" [7]

PLANNING PROCEDURE

I. Objectives

A. General: To teach the basic number facts of the family of 7's in addition.

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[7] Popular Science Publishing Company, Audio-Visual Division, New York. This filmstrip is one of six which comprise the Teach-O-Filmstrip series, Primary Arithmetic.

B. Specific: (Given in sequence of activities.)

1. To develop in the children the desire to know about the family of 7's
2. To present each addition fact through a meaningful experience
3. To clarify each fact by the use of concrete things
4. To make the learning more effective by means of pupil problems drawn from their own experiences
5. To enrich the process of learning addition facts through classroom activities

II. Visual aids

Filmstrip
Objects, specimens, and models
Manuscripted captions to direct activity
Bulletin board
Blackboard
Flat pictures

TEACHING PROCEDURE

I. Motivation: Two methods of arousing interest and extending the desire to learn.

1. Have a worktable scattered with many objects, specimens, and toy models, seven of each.

Toy airplanes
Erasers
Crayolas
Pieces of chalk
Toy cars
Apples
Acorns
Ears of corn
Marbles
Books

Ask the children to arrange each group of objects and specimens in straight rows of seven.

After they have enjoyed making the row arrangement, point out that there is a family of seven in each row; also, that you know of other arrangements, but you are going to let them find these by themselves while watching a filmstrip about the family of 7's. (After the lesson, using the filmstrip, follow up with the activity suggested in that section of this plan.)

2. Write on the blackboard a large number 7. Under it write:

I am the number 7.
I am important.
Do you know about my family?

Place a small card (2″ x 2″) with 7 on it on each child's desk.

Arrange seven attractive pictures on the bulletin board. Put a large number 7, written on construction paper, underneath them.

Arrange seven books around the reading table. Write a large 7 on a sheet of construction paper and place in the center of the table.

The object is to arouse curiosity. If children have been taught to look for new room interests each morning, the question will naturally come, "Why all the 7's?" The response can be, "It's a secret until number period." The period will not come fast enough for curious children.

II. *Teaching the basic facts:* The filmstrip shows the whole experience and does the real teaching. However, the thinking of the children is directed and clarified by the teacher in her statements and questions. More interest and better attention is gained if each child is given the opportunity to read a frame.

For example, the first five frames are shown, with suggested statements and questions for the teacher.

FRAME 1

Mother and Ruth are getting ready for something. Helen, you may read and tell us what it is.

FRAME 2

Ruth invited her very best friends. Ann, you may read the questions and answer them.

FRAME 3

Ruth's mother gave each one a balloon. Harold, you may read these questions and give the answers.

FRAME 4

I see a familiar sign. Buddy, you may name it. What does it mean? Now, you may read the questions.

FRAME 5

Edith, you may read. Is the answer changed by changing the order of the numbers?

III. *Classroom activities*

1. On a worktable place the following label:

Help!
We are lost!
Put us in family groups.

Have scattered on the table many objects, specimens, and toy models.

The children will have much fun in making the arrangements in such groups as:

6 acorns	1 acorn
2 ears of corn	5 ears of corn

And so on.

As a motivation activity, they arranged them in straight rows.

2. Make a small booklet for each family of addition combinations. The child can draw or cut out pictures to use.

Example: On one page have 4 hats in a row, 3 hats in the next row, and underneath write

$$\begin{array}{r} 4 \text{ hats} \\ 3 \text{ hats} \\ \hline 7 \text{ hats} \end{array}$$

Next page, first row—1 shoe, next row, 6 shoes, and underneath

$$\begin{array}{r} 1 \text{ shoe} \\ 6 \text{ shoes} \\ \hline 7 \text{ shoes} \end{array}$$

And so on.

3. Have a bulletin board for pupil use. Place on it the following label:

$$\begin{array}{cccccc} 4 & 3 & 1 & 6 & 2 & 5 \\ 3 & 4 & 6 & 1 & 5 & 2 \\ \text{—} & \text{—} & \text{—} & \text{—} & \text{—} & \text{—} \\ 7 & 7 & 7 & 7 & 7 & 7 \end{array}$$

We are the family of sevens.
Make some problems about us.

Each child can make a picture for the display.

Example:

Pictures of five clowns	5
Pictures of two clowns	2
Pictures of seven clowns	7

4. Each child can make written story problems from his experiences. Example: Saturday Dan and I went fishing. He caught five fish and I caught two fish. Altogether we caught seven fish.

$$\begin{array}{r} 5 \text{ fish} \\ 2 \text{ fish} \\ \hline 7 \text{ fish} \end{array}$$

This lesson was developed to meet the definite purpose of presenting and teaching a number family in addition. The filmstrip was integrated with the motivating and classroom activities to teach the basic facts, and to obtain desired objectives. Such experiences organized around selected audio-visual aids make numbers meaningful and give effective outcomes.

A READING READINESS ACTIVITY

Flat pictures are used extensively in classrooms for numerous purposes. With organized planning they can become a valuable aid to teaching.

The following lesson, giving suggestions for the use of a flat picture, has an essential place in a reading readiness program. Its specific purpose is to promote growth in oral language expression through a picture interpretation experience.

The suggestions can be used in second and third grades as a story writing activity. In these grades the child should construct and write his own story.

Subject: Reading (a readiness period)

Grade: First (with possibilities for second and third)

PLANNING PROCEDURE

I. Objectives

A. *General:* To provide an experience to stimulate oral language development

B. *Specific:*

1. To enrich the oral vocabulary
2. To develop freedom of expression

3. To promote the ability to express ideas in simple sentences
4. To develop the ability to associate meanings with pictures
5. To increase the ability to note picture details
6. To promote growth from picture details into interpretation of what is happening, then into a given story

II. Visual aids

Flat picture	Bulletin board display
Blackboard	Scrapbook

TEACHING PROCEDURE

I. Motivation: As a build-up for the lesson, use a familiar story to gain interest and guide thinking to thoughts of walking and seeing things.

Hold up the book of "The Three Bears." Ask: "In this story, who went for a walk?" "While Goldilocks was walking, what did she find that was interesting?" Such questions are good to recall parts of familiar stories and to connect story thoughts with titles. Then lead into this question: "Can you think of sometime when you were walking and saw something interesting?" Let the children share their experiences by talking freely. They will then be ready to express thoughts in the following flat picture lesson period.

II. Teaching the flat picture: Center the attention of the children on the picture and interpret it through oral picture reading. The following lesson has been planned around a particular picture, but the same techniques can be used with any flat picture.

"*Skip Along,*" *Picture 9.*[8] Explain that you are going to show them an interesting picture of Alice and Jerry, who made a discovery as they were taking a walk. Suggest that they read the picture, and see if they can find what Alice and Jerry discovered and if they think the children are enjoying themselves.

The following statements and questions are given to show how to develop free expression and the ability to note picture detail with meaning. All thoughts are in reference to the real picture in color. The print shown in this book is in black and white.

1. Who went with Alice and Jerry on their walk? Yes, Jip. Of course, Alice couldn't go far without her puppy.
2. Look at them. What tells you they are having a good time? (Interpret the expression on their faces, including Jip's.)
3. Now, by this time, I know you have found what Alice and Jerry discovered. (Discuss the nest, how it is made and hidden; also count the eggs. Bring out the meaning of the word "discover.")

[8] Row, Peterson and Company, Evanston, Ill.

4. If you can tell me where Alice, Jerry, and Jip are, I know you can give the name of the bird to whom this nest belongs. (This gives them the opportunity to think and reason. They get the word "meadow." Then ask what bird builds its nest in the tall grass of the meadow. If necessary, the teacher may suggest that because it sings so beautifully, part of its name is lark.)

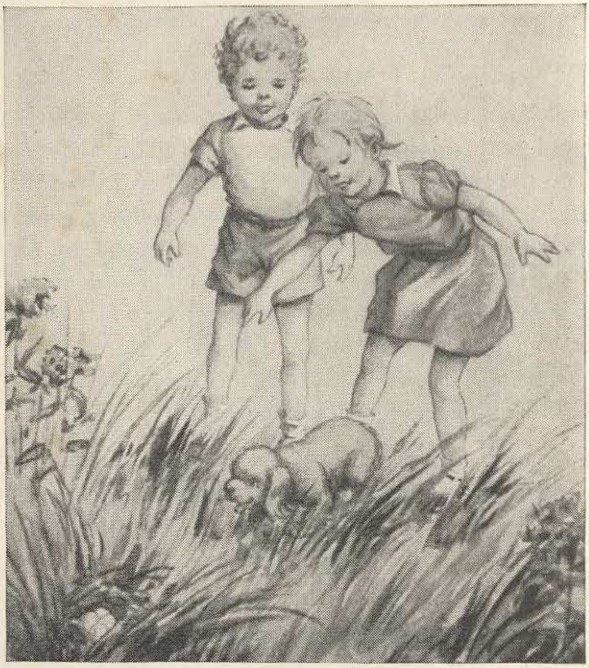

FIG. 10. See what Alice, Jerry, and Jip found!

5. Where do you suppose the meadow lark is? (Discuss how to be friends to birds.)
6. It is a lovely day for Alice and Jerry to be out walking. What tells us it is a lovely day? (Talk about the blue sky, the yellow light on the green grass and brightness of the picture—as if the sun is shining. Also talk about the light breeze blowing through the tall blades of grass. This will develop the ability to reason and add meaning to the picture.)
7. I also know it is nice warm weather. Who can tell why? (Discuss the green grass, flowers, and children without coats. The bird nest might suggest the time of year.)

8. We know the children and Jip are excited about their discovery. What do you think Alice and Jerry are saying? (Give ample time for free expression.)

The children must be encouraged to use complete sentences, and, of course, these will be very simple. As questions are asked and answers are given, make note of them on the blackboard.

Examples:

Alice and Jerry went for a walk.
They found a bird nest.
The meadow lark was not at home.
And so on.

After the children have discussed the picture, organize the interpretation into a given story. From the thoughts of interpretation on the blackboard guide them into giving a complete oral story. As told, it should be written on the blackboard and called their story. It would go something like the following:

A WALK

One day Alice and Jerry went for a walk.
Jip went too.
The sun was shining and it was warm.
They walked to the meadow.
They found a bird nest.
It was the home of a meadow lark.
Jerry said, "Look, Alice, and Jip, look!"
Alice said, "I see four eggs!"
Jip said, "Bow-wow!"
Alice, Jerry, and Jip had a nice walk.

III. **Follow-up activities:** For group participation and to provide further oral language development

1. *Picture story*

   Have each child draw a picture story of something he saw when he was taking a walk. He should stand before the group and tell the story of his picture.

2. *Bulletin board display*

   Let the children bring pictures that interest them and suggest stories. Have them arrange their own bulletin board display. Then discuss the display of pictures during a conversation period.

3. *Scrapbook*

   Let the children work together in making a large scrapbook, consisting of pictures of things they might see while going on a walk.

Write each item on the blackboard in the form of a vocabulary list. Refer to this list during discussion periods.

The value of a reading readiness program is the success that it has in preparing the child to read and in giving him the desire to read. A background of experience, a vocabulary knowledge, and the ability to use words with meaning, freedom of oral expression, power to reason, and ability to organize ideas are important factors in this preparedness program.

This activity has provided an experience to stimulate such development.

1. Picture interpretation provided enrichment of oral vocabulary.
2. Opportunity was given for freedom of expression during the discussion.
3. The questions provided opportunity to associate meaning with pictures, to use reasoning in thinking, and to express ideas in simple sentences.
4. The construction of the story promoted ability to organize ideas.
5. The entire activity helped build a background of experience through a vicarious activity.

Therefore, the desired objectives have been fulfilled, and the child has received growth in important factors in a reading readiness program. The plan expresses the extreme value of flat pictures as an aid in building the developmental necessities for beginning reading.

A LET'S COUNT ACTIVITY

In the academic process of learning, one of the first things children learn to do is count. This counting must not be mechanical or by memory of the mere forms of speech alone, but have purpose and understanding. This can be promoted by using varied approaches and techniques. The following suggestions are to make counting more meaningful:

Grade: First *Subject:* Numbers

Motion-picture Film: "Let's Count."[9]

Objective: To put thought, purpose, and understanding into counting.

Motivation: Center attention and build interest toward counting with a quick group activity.

Take the number of small blocks that it is desired to have counted, and before the children arrive, put them in partly hidden places in the room. At a given period, permit the children to scatter about the room and hunt the blocks. They are not to pick them up, but as they see each one to count it. As each child thinks he has seen and counted all the blocks, he comes to the front of the room and sits.

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[9] Coronet Instructional Films, Chicago, Ill.

When all the children are finished, suggest that they can count the blocks as a group to see how many have the correct number. Give individuals an opportunity to go get a block that was seen and place it on a table. As each block is placed on the table, a child puts a mark on the blackboard. When all blocks are on the table, they should be counted. Also count the marks on the blackboard. This experience helps the children to form the concept that each block is one, but as a whole there are many—the number counted.

POULTRY FEEDS
Quality Results at Low Cost

FIG. 11. "One, two, three, four, five." (*Coronet Instructional Films.*)

Then tell the children that with the help of a motion-picture film you are going to let them watch two children, Sally and Joe, count. Suggest that they watch carefully and count with Sally and Joe to see that they make no mistakes.

The film: "Let's Count." Show without comment.

Clarifying experiences: Small children always enjoy trying what they see someone else do—even the very simplest of things. Therefore, it seems very suitable to clarify this film by letting them go through the same experiences as Sally and Joe. It may not be possible to repeat everything shown, but use as many of the materials as available. Use the same techniques and same numbers. For instance, make sure there are 10 marbles in a bag and that they are counted as taken from the bag to the box. Also, have nine blocks in the house, and as counted, make a mark for each on paper, and so on. The children are learning through clarification of Sally's and Joe's experiences. Seeing, doing, and understanding is for better remembering.

Follow-up activities: Make use of every opportunity possible to count. The children must feel that counting is necessary; that it is something they need to know. Therefore, count attendance, count the books needed for group reading, count the erasers and chalk needed at given periods, count the chairs needed for various activities, count scissors, pencils, and paper as they are prepared for use, exercise counting during play periods, and so on.

Provide ways to make individual counting attractive. As an example, two simple ways are given:

1. Have a container filled with shelled corn. Let the group find out who can hold the biggest handful. Each takes a large handful and goes to his table and counts the grains. The pupils are exercising their ability to count. It has meaning because there is a motive for it, and they are finding out how many.
2. Make up games with dominoes, such as: Put the dominoes, turned upside down, in the center of a table. Have a small group of players sitting around the table. Each takes a turn in drawing a domino and placing it right-side up in front of him. They keep doing this until the dominoes are gone. Then each player counts the dots on all the dominoes he has in front of him. The one with the most dots is the winner. This game is fun and promotes counting.

As a whole, the value of this activity is to help fix concepts in mind. The film, as an audio-visual technique, is meaningful because it is related to the pupils' own classroom activities. They watch the children count in the same manner that they are being taught; then they repeat Sally's and Joe's experiences, and follow up with many more counting activities. Repetition is clarifying, and gives meaning and understanding to counting.

AN ACTIVITY IN AUDITORY DISCRIMINATION

Many factors are involved in developing satisfactory reading results. One of the most important is an efficient word recognition program. The first step in such a program is to provide ear-training experiences. The following activity period is planned to suggest the use of a textfilm made for this specific purpose—to introduce auditory discrimination.

Subject: Reading *Grade:* First

Objectives

A. General: To promote growth in auditory discrimination

B. Specific:

1. To develop ability to hear that certain words begin with identical sounds
2. To promote application of known vocabulary words
3. To give experience in ear-training techniques

Procedure

I. Motivation: Present an opportunity to build listening alertness. Tell a story using many initial consonant sounds. Just give the beginning letter sound and let the children fill in the word.

Example:

Yesterday I went to visit my aunt. She lives on a f(*farm*). After lunch we went to the b(*barn*). I saw the mother c(*cow*) and her baby c(*calf*). The h(*horse*) was in her stall, and the p(*pigs*) were eating c(*corn*) in the barnyard. I wanted to see some ducks; so we climbed a f(*fence*) and went across a m(*meadow*) to the p(*pond*). A mother d(*duck*) and her d(*ducklings*) were swimming. Then we walked back along the p(*path*) to the h(*house*). It was then time to start h(*home*). I had a very enjoyable afternoon.

This exercise is auditory and makes the ear alert for the following experience:

II. Teaching the textfilm: This correlates with "Skip Along," the first preprimer of the "New Alice and Jerry Books." For this lesson only two frames are used in the given period. (Figs. 12 and 13.)

This frame is the word recognition picture. To make the value of such a picture understandable, specific suggestions for presentation are given.

1. Have the children look at the little picture in the corner of the big picture.
"What do you see?" "Yes, Jack-in-the-box." "Let's hear you say it again—Jack-in-the-box."

2. Tell them to now look at the big picture and read it. If the children have had sufficient experience, call on individuals to tell a story of the picture. If they do not have the ability to interpret what they see into a story, give guidance to the picture reading by means of statements and questions.

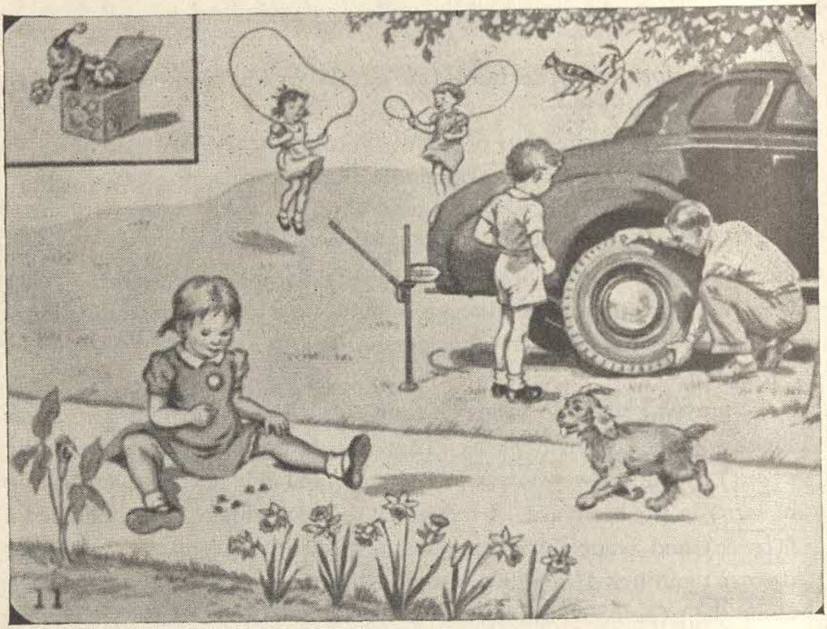
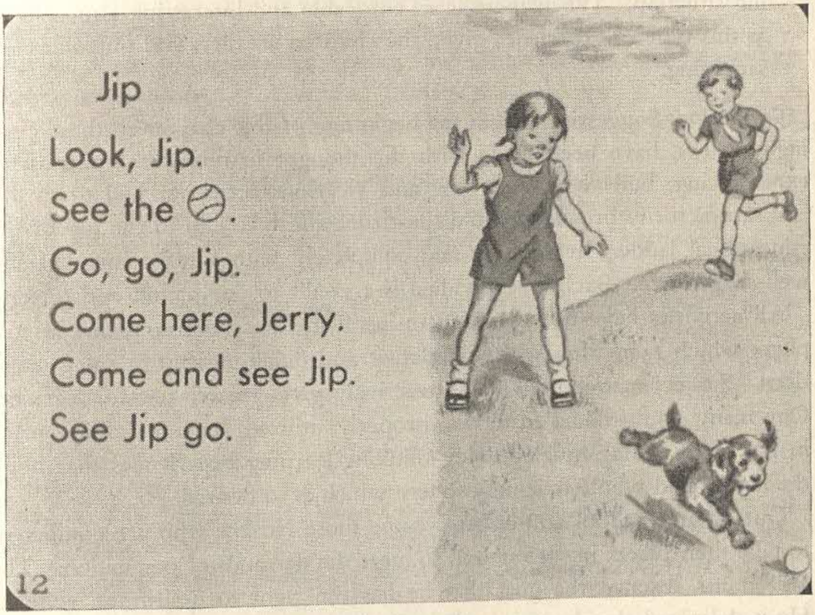


FIG. 12. What do you see?

Example: "Alice seems to be having fun. What is she playing?" (Jacks.) "What are her friends doing?" (Jumping rope.) And so on.

3. Through story or questions, attention is called to the main things in the picture. Then relate that, while they were talking, they used several words that began the same as Jack-in-the-box. Give each an opportunity to name one thing and prove it in this manner: "jay—prove it—listen, Jack-in-the-box—jay. Do they begin the same?"
4. After this experience of listening, proving, and hearing the identical sounds of the initial consonants, continue to the next frame.

This frame presents known vocabulary in a new story. Call attention to the characters in the picture and to Alice who is playing with Jack-in-the-box. Then have the title read, suggest that Alice is talking, and have the story read. Read by sentences and then read the complete story. This will test their ability to apply the vocabulary they have learned to the reading of new content.



Jip

Look, Jip.
See the ⚾.
Go, go, Jip.
Come here, Jerry.
Come and see Jip.
See Jip go.

12

FIG. 13. A new story.

III. Techniques: To follow the activity period and to give more experience in training the ear to hear beginning sounds.

1. I am going to give three words. Listen and see if you can hear two that begin the same.
   cow–man–camera
   Jack–jump–boy
   And so on
2. I am thinking of something to play with that begins like Jack-in-the-box. Of what am I thinking?
   I am thinking of something to eat that begins like cow. Of what am I thinking?
   And so on.
3. I am going to tell a story. Listen, and every time you hear a word that begins like rabbit, repeat it. See who can be the first to find the words.

   Example: Alice went into her room to get her raincoat and rubbers. She saw her jumping rope on the rug by the radio. She picked it up and put it on the table by the vase of roses. Then she went out to play in the rain.

The use of the textfilm provides an appealing and captivating learning situation. When there is an enjoyable and interesting atmosphere, as this type of experience gives, the children are alert and outcomes are satisfying.

Conclusion: Suggestions, from the beginning of this chapter to these closing remarks, have been made with the thought in mind that purposeful experiencing, built with both real and vicarious activities, will gradually and satisfactorily broaden a child's horizons and take him to the top of the educational ladder, living fully and completely with a truly rounded and well-shaped life. Such an individual is a credit to our nation and society.

All activities have been planned to instill in the schoolroom that atmosphere which is inviting with stimulating and quick-moving learning situations. Subject matter presented attractively gives greater zest for learning. Our many audio-visual materials, properly utilized, have a definite place in providing seeing-hearing-doing-thinking-learning experiences that build the happy and wholesome atmosphere which is so desired.

Out of such school atmospheres come those citizens who are competent to take their places in society and to meet the demands of our nation. The citizen has reached the goal that he has the right to desire and achieve. He is delighted that he accepted the invitation: Come and Climb!

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15

USING AUDIO-VISUAL AIDS IN THE INTERMEDIATE GRADES[1]

An old Chinese proverb, "One see is worth one hundred tells," is the basis for the fine opportunity a classroom teacher has today. With all the many visual-audio aids on the market and in the classrooms, teachers have the opportunity to teach more than ever before in the time allowed them. These aids are necessary and vital to meaningful and quick learning. Meaningful in that the child is interested in something that becomes a reality before his eyes. He has a genuine interest in reading and discussing something that seems very real to him. He works happily because he is sincerely interested. Keeping the child happy and interested by giving him materials he can hear, see, and feel ensures that he will learn.

This chapter is written for the middle grades. Geography, history, and science have been chosen as a core in the three units. Individual lessons consist of work in safety and arithmetic. Most of these suggestions for the use of audio-visual materials can be adapted to similar units in the middle grades. For example, one could read the unit on Switzerland and adapt the activities in arithmetic or word study to a unit on Holland, Egypt, or any other country. A field trip to some place of interest could be worked out by any grade in the intermediate group.

Naturally, the various related topics or aspects of a unit should be correlated in order to form a single major concept instead of several separated concepts. In the same way, audio-visual aids should not be considered or used as a separate unit or lesson but as a correlated and integrated part of the whole teaching procedure. This is another way of saying that when an aid is used in such a manner that the pupils' attention becomes centered on it instead of on the idea or topic being reflected by it, then that aid is being unwisely utilized.

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[1] This chapter was prepared by Irene Anderson, Glen Oak School, Peoria, Ill.

CHILDREN OF SWITZERLAND

Fourth-grade Geography

From Lowlands to Highlands. It was time to say good-bye to friends in Holland. All baggage had been put aboard an airliner for Switzerland. A trip to Switzerland was coming! Pictures of Switzerland filled the bulletin board.[2]

While in Holland in their health study of milk, the class was taken on a trip to a dairy farm. The children learned that milk is an essential for a proper diet. By-products are sometimes used in the place of raw milk. The geographic surface and population of a country are deciding factors in the production of milk. The class had devoted much time to studying different breeds of milk cows and where they were to be found. The group was ready to fly to Switzerland.

Objectives:

1. To interest the children in the study of Switzerland
2. To show the effects of environment on life in the Alps
3. To develop an appreciation of the admirable qualities of the Swiss people
4. To show climatic effects upon people's activities
5. To make clear that Switzerland is a democratic society like our own

MOTIVATING CHILDREN'S AIMS

Flat Pictures

When we visit, we always like to know whom we will see when we arrive at our destination. We were in the air, high above the clouds, flying southeast. We were to land at Interlaken, Switzerland, to visit Trudi and Hans and their parents.

When their pictures in "Hans of the Swiss Alps" (Encyclopaedia Britannica Press) were shown to the class, the questions came: "Do Hans and Trudi look like interesting people? Would you like Trudi and Hans to show you Switzerland and tell you about the work and recreation of this country? What would you like to know about this country?"

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[2] *National Geographic*, March, 1922; vol. XLI, pp. 277–292, March, 1933, vol. LXIII, pp. 344–353. These pictures may be obtained from National Geographic Society, Washington, D.C. (see p. 586).

The following questions were decided upon and placed upon a part of the blackboard where they could be left for future reference and where additions could be made:

1. From what direction did we fly when we came from Holland?
2. Is Hans and Trudi's home near the mountains?
3. Do Hans and Trudi go to school?
4. What language do they speak?
5. What does their father do for a living?
6. Do they have the same work all year?
7. In what kind of houses do they live?
8. Do they have four seasons as we do in this part of the United States? (Enough traveling had been done for the pupils to realize that all people do not have the same number of seasons.)
9. Do they have automobiles, busses, trucks, planes, and trains as we do?
10. How many different ways could we travel into this country?
11. Do the Swiss do any farming?
12. What do Trudi and Hans do for recreation?
13. Do they like music?
14. Do they go to school?
15. Are there songs written about Switzerland?
16. Does their music tell us anything about them?
17. What foods will be served to us while we are in Switzerland?
18. Do we have articles in our country made by Swiss people?
19. Do many people from our country visit Switzerland? Why?
20. Would we want to live in Switzerland?

LOCATING SWITZERLAND

HANDMADE SLIDES

The teacher traced a small map of Europe on a frosted slide. When this map was shown to the pupils, they decided they must fly southeast over Germany and France to arrive in Switzerland. A committee of two pupils was appointed to trace on the slide the route they expected to take. In further class discussion of this slide the following were noted:

1. Switzerland is bordered on the north by Germany and France, the east by France, the south by Italy, and the west by Italy and France.

2. Switzerland is a tiny inland country with no seacoast or navigable rivers; thus no big steamers could visit Switzerland. If the class had not come by plane, they would have come by train, bus, or automobile.

The children wrote the name of each country that borders Switzerland on their blank maps and traced their trip from Holland to Switzerland on the same map. Those who had trouble referred to the screen.

The instructor screened another handmade slide which showed that more than half of Switzerland is crossed by the Alps, and north of the Alps lies the plateau region with its many lakes. The pupils compared these physical features with those of Holland. They discovered Switzerland does not have lowlands or wide river plains but consists of high mountains, plateaus, and lakes. This slide was shown on the blackboard, and one student traced the outline on the board. Someone suggested it be used as a product map of Switzerland, and they could place pictures of the people and products in the proper regions as they traveled through the country.

During this discussion the students made the following additions to the question list on the blackboard.

21. Do these large countries surrounding Switzerland have any influence on the Swiss people and their government?
22. What products do the Swiss people have to sell to other countries?
23. What products do they buy from surrounding countries?
24. Are there any minerals in all this mountain area?

SEEING SWITZERLAND

MOTION PICTURE

They were now in Switzerland and must find Trudi and Hans! What questions did they want to ask them? The pupils reread the questions to make sure they included all questions they wished to ask.

"Children of Switzerland" (Encyclopaedia Britannica Films Inc.) was shown without interruption to the group. Immediately after the showing of the film, the group took up each question and tried to answer it. The pupils were given an opportunity to copy the questions and answers in their notebooks. Checking the questions they could not answer, they realized they must go in search for more information. A committee was selected to gather as many references from the library as could be found and bring them to the reading table for further reading. The class read the text, "Our Big World" (Barrows, Parker and Sorenson), to find answers to their questions. The class discussed answers from this source and dictated them to the instructor who wrote them on the blackboard while the class copied these answers in their notebooks.

However, the class had questions that were still unanswered. The pupils spent several periods looking over and reading the references that had been brought from the library. Some of these were "Land of William Tell" (L. J. Bragdon), "Little Journey to France and Switzerland" (M. M. George), "Ski Gang" (George Herring), "Jano and Jeni" (Maria Van Vrooman), and "Anton and Trini, Children of the Alp Land" (Silver).

ACTIVITIES

During these reading and discussion periods, the class expressed a desire to build a Swiss scene in the room. Should it be a winter or summer scene?

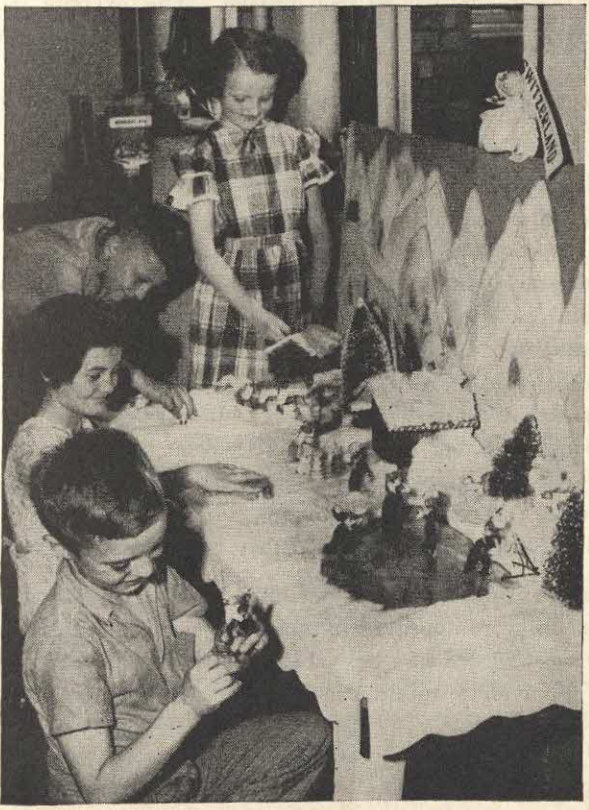

FIG. 1. Working on "The Swiss Scene."

The class visited Hans and Trudi in the summer, but because most tourists go to Switzerland in the winter, it was decided upon the construction of a winter scene. A committee was selected to gather all appropriate ideas for this Swiss project, these ideas to come from class members during the study of the unit. Actual construction would be done near the end.

ARITHMETIC—BLACKBOARD

The pupils were, of course, interested in mountain climbing and skiing, and hence the instructor drew snow-capped mountains on the board with colored chalk. Multiplication combinations were placed upon the painted mountainside. A child could start at the bottom of the mountain and climb to the top by giving the correct product to these combinations. The beginning of a ski jump was located on the top of the mountain. For the jump, the teacher drew combinations above the mountainside. It was a great thrill to the pupil to climb the mountain and come down by way of the ski jump without making one mistake. This exercise increased the pupils' speed in multiplying, and, owing to the contest idea, added many new words.

Other periods were spent in making and solving problems such as the following:

1. Trudi and Hans wished to visit their father in the summer Alps. How far is it if it takes them 4 hours and they can walk 2 miles in one hour?

2. Father started making cheeses. Each day he makes 2 cheeses weighing 35 pounds each. In 7 days, how many pounds will he have to send down the mountain?

3. Jungfrau, one of the most beautiful peaks in Switzerland, is 13,571 feet above sea level. Electric trains take tourists up 11,000 feet and they must go the rest of the way by elevators. How far do they go by elevator?

4. In French-speaking cantons, where village life centers around vineyards, the girls are picking grapes. Monday they picked 105 pounds, Tuesday 115 pounds, Wednesday 95 pounds, Thursday 75 pounds, and Friday 111 pounds. How many pounds did they pick that week?

Each child wrote problems about his experience in Switzerland. After these problems were approved by a Reviewing Committee chosen by the class, they were placed in a box labeled "Swiss Problems." Everyone was given an opportunity to draw a problem out of the box, read it, and solve it for the class.

MUSIC—RECORDS

One day as we were about to begin our music class, someone reported that he found a song about Switzerland in our musicbook.[3] After listening to a class member read the words, the group decided that this should be a happy song sung in a gay mood. Little Heidi was having fun high up in the mountains. The class listened as the song was sung; it was understood that the little girl could hear her echo as she yodeled. It was easy to sing this song by memory, and each listener seemed to be as happy as little Heidi herself.

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[3] "The Music Horizons," Book Four, Silver Burdett Company, New York.

Someone remembered that the group had learned a Swiss song in the third grade so the following day three boys went to the third grade and borrowed the musicbooks.[4] As the pupils listened to "The Alpine Shepherd," they decided it revealed the seriousness with which a Swiss boy would regard his responsibilities. Others thought they could feel the height of the mountains from singing the song.

Now, they became curious about records of Swiss music. The instructor played the "William Tell Overture." The pupils were to sit quietly and listen to "The Dawn" and see if they could guess what kind of a morning it was in the Swiss Alps. After listening, some suggested it must be a very cloudy morning with a storm approaching. Others thought it a very bright morning with everyone hustling and bustling around. If they listened to the next record, they could tell just what kind of a morning it was. Soon they knew the morning was stormy. They listened to the storm approach, reach its height, and slowly die away. With the next record they seemed to feel the calm.

Before the overture was played, the class was told that it was a Swiss soldiers' march. Later some suggested it might be the skiers whirling down the mountainsides. Here, too, they seemed to grasp the energetic spirit of the Swiss. In art, the class suggested these records be played while they were painting the mountain scenes for their construction project. This did much to create an atmosphere for the students while they worked. Again the class read the questions on the board and wrote answers for those which concerned music.

HEALTH—FILMSTRIP AND CHART

The filmstrip "Children of Switzerland" furnished interesting pictures for an enlightening health lesson.

A large chart of the Basic Seven Foods was displayed and these questions were asked: Which of these seven foods are in the basket? Are all these foods grown in Switzerland, or are some of them imported? Which ones? Why aren't milk and cheese in the basket? Do the Swiss have a well-balanced diet? Would that account wholly for the healthy looking people you saw in Switzerland? (One pupil suggested that because much of their working was out in the fresh air, this might help to account for the good health records of the Swiss people.) How are their foods preserved in winter?

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[4] "The Music Book," Book Three, Silver Burdett Company, New York.

Because of Switzerland's many rushing mountain waterfalls, electrical power is very easily generated in Switzerland. Owing to this abundance of "white coal" more homes in Switzerland have electricity than any other country in the world. Many electrical appliances are used in the homes. Nearly all Swiss trains are operated with electricity. The job of entertaining people from all over the world is much easier and more pleasant because of this great and ready supply of electricity.

After the filmstrip had been discussed, the list of questions was read and those on food were answered.

Language Arts: Word Study

Handmade slides: In word study a glass-frosted slide was used. The teacher drew a pretty skater surrounded by the following words:

chalet
rennet
Alps
pass
alphorn
glacier
procession
yodel
shepherd
avalanche
tourist
curds
echo
edelweiss
white coal

The class discussed the pronunciation and meaning of these words.

After several periods of study and discussion, a completion test, using such statements as the following, was given.

1. The _______ blossom is Switzerland's national flower.
2. Interlaken is the most famous _______ resort of the Alps.
3. The Swiss love to sing, and especially to _______.

Riddles were made by the pupils. Here is an example: "It is used in making cheeses. It comes from the stomach of a calf or sheep and makes the cheese curdle so that the curds can be separated from the whey. What is it?" The pupils derived much pleasure from hearing these riddles read and trying to guess them. Those that were poorly written were improved by class suggestions.

Language Arts: Letter Writing

The pupils had studied letter writing and as anyone who is traveling would naturally do, each one decided to write a letter to some member of his family at home. Many wrote clever letters using much information from the motion picture, "Children of Switzerland." One of the letters written by a fourth grader follows:

716 Chalet Avenue
Interlaken, Switzerland
May 3, 1948

Dear Toni and Jani,

I am staying at Trudi and Hans's house. Trudi is just about my age. Hans is a little older. Hans has a big brother named Herman.

Trudi and Hans speak German and I am learning fast because everyone here speaks German.

When I first came, I wondered why there was snow on the mountain peaks. It was a very warm day. Trudi told me that there was snow on the mountains because the air was cold enough up there to make the snow stay all year around.

Last week almost everyone in the community was making wreaths, decorating their cows, and pressing their best clothes. I asked Trudi why they were doing all this and she said it was for a parade. This cow parade was going to be Sunday. Everybody in the little community brought their cows to the village. Trudi's father and Herman brought their cows to the village. Bands were playing in the street and everybody had on their best clothes. I wore one of Trudi's dresses. In the afternoon the goatherds, the carts with all the pots and kettles in them, and the cows all started up the mountain. Trudi's parents' cow was the queen cow. The queen cow always wears a bell that is about one hundred years old. This cow is considered the best one in the community.

That night for supper we had milk, cheese, and whole-wheat bread. For dessert we had ginger cakes. The Swiss people are noted for their ginger cakes.

At night I sleep with Trudi in a beautifully carved bed. It is very pleasant here for everything is kept very clean.

Monday morning Trudi and Hans took me to visit their school. In the morning I visited Trudi's room and in the afternoon I went with Hans. They go to the Glacier School. They have a very nice school and Trudi says that all people in Switzerland can read and write.

After school Hans and Trudi took me to a clock shop. There were all kinds of clocks. Many of them had been carved by the man who owned the shop. I bought one to take home to mother. As we were going home we decided to sit on the fence and watch the tourists and other people in the streets. Hans said that this was one of their favorite pastimes.

In the winter, Trudi's father works at Johnsens'. They make chocolate candy and chocolate milk. Saturday we went up to see Trudi's father and Herman. Hans carried a queer shaped basket on his back. The basket had bacon, fresh meat, and vegetables for father and Herman. These Swiss people have a well balanced diet. All of us had to wear shoes that had spikes in the bottom. These kept us from sliding in the steep paths. Even with these shoes it was bad to climb. We stopped to rest when we were half way up. It seemed we had climbed such a long way, but when I looked up, the mountains still looked very high. These mountains with their snowy peaks are very beautiful.

When we arrived at the chalet, Hans' father was making cheese. First he poured the milk in a copper kettle. He let that heat for a while, then poured something into it. I asked Trudi what it was and she said it was rennet. Then he let it heat until it curdled. Next he poured it into a mold and let it set. He said they would have to make trips home and bring the cheese down the mountain. I was surprised when I found some of this cheese was taken to America.

By the time we had talked and eaten a lunch of alpine tea, fresh cheese and some ginger cakes, it was time for us to start home. As we were going home Trudi told me that her father would soon send the two strongest goatherds down with cheese. They would carry the cheese in "birds" on their shoulders. She explained to me that a "bird" is a round case that holds a fifty pound cheese.

When we arrived home we were ready to sleep. The air is cool and fresh here so one has no trouble sleeping. Switzerland is a beautiful country which I hope you can visit. I will write again soon.

Your cousin,
Marietta

EVALUATION

After many of the letters had been read to the class and our "Questions and Answers" had been reviewed, it was time to evaluate the work by a test which included such exercises as the following:

Completion:

1. Switzerland is a tiny country located in the heart of _______.
2. Switzerland is sometimes called "_____ _______ ___ __________."
3. The _____ and _____ are the chief mountains of Switzerland.
4. The Swiss have a government like ______________.

True—False:

__1. Most Swiss have a balanced diet.

__2. The coal of Switzerland is white.

Matching:

yodel	a small hut
edelweiss	electricity from water power
white coal	a flower
chalet	a way of singing

Answer the following questions in a paragraph:

1. Would you like to visit Switzerland? Why?
2. How is Switzerland different from Holland?

THE SWISS SCENE

A committee had been appointed to do the background for the table scene. The scene was painted on wrapping paper and supported on a mattress carton. The Gothard Pass was made by cutting a hole in the cardboard and through this a toy train could emerge from the background. Other pupils built chalets, and one child made a hotel for the tourists. Tiny figures for skating were made from imitation poinsettia blooms. By placing a glass over white paper a skating lake made a pretty setting

FIG. 2. A well-planned demonstration with real materials represents an effective type of audio-visual instruction. (*Courtesy of Mildred Sheppard.*)

for the red figures. Small Christmas trees, cotton, and artificial snow completed the scene.

The children were so elated with their scene that they wanted their mothers to see it; they decided to invite their mothers to come for the last half-hour period on Friday. Each pupil made a cover for the material he had collected in his notebook, and these completed booklets were put on display. The group also decided that the maps on the slides should be reviewed for the mothers. Two pupils were chosen to do their arithmetic skiing feat on the board, and two others read and solved two of their most interesting problems.

The refreshment committee served cheese, ginger cookies, and milk while the music committee played the recording, "William Tell Overture."

The name "Switzerland" had taken on a new meaning for the entire class. The children seemed to have caught the spirit of the energetic, democracy-loving Swiss. An understanding of a people who are able to develop the few natural resources to their full capacity was promoted. Naturally, a definite desire was created to visit this small nation in the heart of Europe.

COMMON ANIMALS OF THE WOODS

Fifth-grade Science

Teacher preparation: The study of common animals was about to begin in the fifth-grade science class. The teacher checked the audio-visual aids library to see what help could be found to aid her in teaching this subject. As a result, the following materials were selected:

1. Film and filmstrip: "Common Animals of the Woods" (Encyclopaedia Britannica Films Inc.)
2. State museum pamphlet: "Illinois Mammals Today and Yesterday,"[5] Virginia S. Eifert.

The instructor ordered these materials and previewed them. She studied all materials carefully in order to plan the most effective method of presentation and to note the contributions they could make in the learning situation.

Over-all Objectives

1. To create interest in the common animals of the woods
2. To enable boys and girls to recognize some of the common animals of the region in which they live

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[5] This pamphlet pictures and describes different specimens of animals as shown in their natural abode at the state museum in Springfield, Ill.

3. To give specific information on the physical characteristics, homes, food, value, and ways these animals have of protecting themselves
4. To give information on animals that have become extinct in Illinois

IMMEDIATE OBJECTIVES

Only Scene One of the filmstrip was shown at the opening of the class period. While this scene was on the screen, the group was asked: "Have you ever visited a woods or park with a scene like this?" "Have you ever thought how many homes of different animals might be located in such a place?" These questions brought a discussion of the many birds that might be seen in such an area, as well as such animals as squirrels, rabbits, and snakes. This discussion led to the following objectives:

1. To acquaint boys and girls with the common animals of the region in which they live
2. To use the film, filmstrip, and a field trip to the state museum to create interest and add knowledge
3. To teach simple facts about an outline and its use
4. To give practice in oral reports
5. To construct habitat groupings of common animals as work in art and as a check of the knowledge acquired in seeing, hearing, and reading about these animals

MOTION PICTURE

OUTLINES

The pupils were asked, "If you could go into this deep woods and visit some of the animals living there, what are the things you would like to learn about them?" After a short discussion, three definite objectives were agreed upon and written on the blackboard.

1. What animals would the class see if it went into the woods?
2. What kind of homes do these animals have?
3. What do these animals eat?

Information was needed as to the way they would visit these animals and the reason for the method used. Because most of the animals of the woods are nocturnal in habit, it would be almost useless for the pupils themselves to go. Too, most animals are very shy and hide at the least strange noise. Naturalists worked many months to photograph a few scenes of these animals and their characteristic activities. Since the class could not go successfully, it would have to depend upon the film produced by these naturalists.

VOCABULARY

Because animals are classified according to their food habits, the following work was given in vocabulary. Some of these animals they would see are

FIG. 3. Dinner time! (*Encyclopaedia Britannica Films Inc.*)

carnivorous or flesh eating, others are herbivorous or plant eating, and some might be omnivorous or plant- and flesh-eating animals. Carnivorous, herbivorous, and omnivorous with definitions were written near the three above objectives. If the pupils could find out about the food of each animal they could, of course, classify them. "Again, what were the three things for which we are to look for in the film?" Someone summarized them as the animal's name, food, and home.

SEEING THE FILM AND FOLLOW-UP WORK

The film, "Common Animals of the Woods," was shown without interruptions. Everyone was intent on viewing the many animals and listening to the narration. As the vocabulary was very simple, it was easy for them to understand. The showing of the film took about fifteen minutes' time.

Immediately after seeing the film a chart was drawn on the board in which to list the information acquired. Each child was called upon to contribute while the teacher wrote the information. Upon completion the chart looked like this:

COMMON ANIMALS OF THE WOODS

Name	Home	Food	Type
Raccoon (Coon)	Hollow tree	Mussels Crawfish	Carnivorous
Porcupine		Tender leaves	Herbivorous
Otter		Fish	Carnivorous
Mink		Fish	Carnivorous
Beaver	In or near water	Bark of trees	Herbivorous
Opossum	Hollow tree	Fruit Chickens	Omnivorous
Skunk	Dens in the ground		Carnivorous
Woodchuck	Dens in the ground or among the rocks	Chickens	Carnivorous

The pupils wished to finish this chart, but it was difficult for them to recall all the information given by the film. The common squirrel and rabbit were not listed because the class knew much about them from their study in the primary grades.

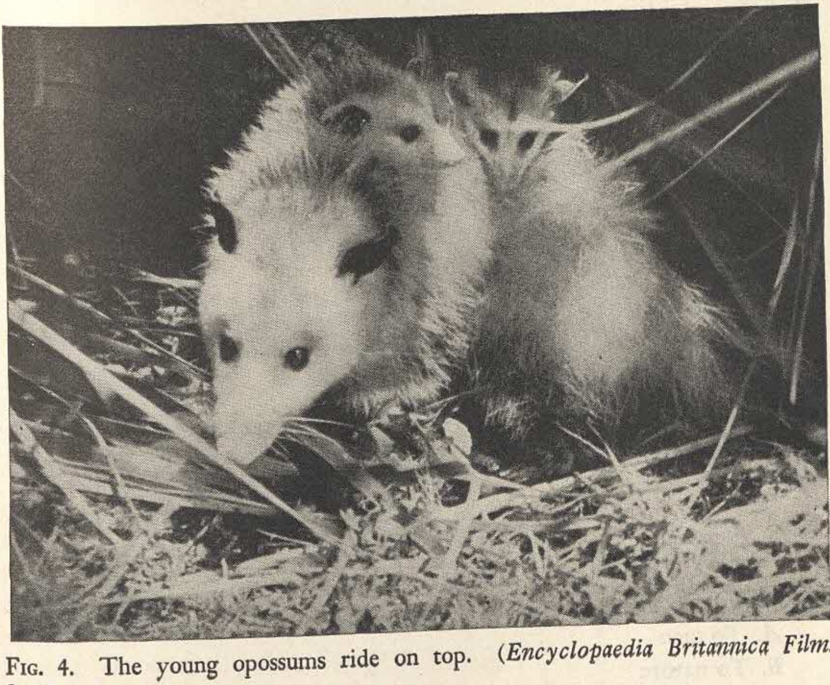

FIG. 4. The young opossums ride on top. (*Encyclopaedia Britannica Films Inc.*)

USING THE FILMSTRIP

Each member of the class was interested and now ready to learn more about these animals. "Would you be interested in making these animals in miniature and placing them in a natural setting similar to that which we will see at the museum? Of course you would! Art of this type always appeals to young people. Information for such a project would require more knowledge than your chart now shows. Sometimes when people wish to collect much knowledge in one subject, they use an outline. An outline is a simple plan of putting the information down by topics and subtopics. What would you want to know about these animals if you were going to make habitat groupings of them?" A discussion followed, and the teacher wrote their ideas upon the blackboard in outline form explaining the headings and subheadings. The following outline was worked out.

COMMON ANIMALS OF THE WOODS

Name

I. Appearance
    A. Size
    B. Color
II. Characteristics
    A. Body
    B. Habits
III. Homes
    A. Where
    B. Materials used
    C. Type
    D. Size
IV. Food
    A. Foods eaten
    B. Classification (carnivorous, herbivorous, or omnivorous)
V. Protection
    A. By nature
    B. By man
VI. Young
    A. Name
    B. Number
    C. Other facts
VII. Usefulness
    A. To man
    B. To nature

The filmstrip, "Common Animals of the Woods," was ready for use before the next class period. The outline form worked out in the last period was on the blackboard. Everyone had pencil and paper. All pictures of the raccoon, the first animal shown in the filmstrip, were viewed and discussed. Here is where an important value of the filmstrip lies—the pictures can be viewed as long as there is need for them, and they can easily be turned back to check any questions that come up later. During this period the teacher led the discussion to bring out the facts needed for the outlines. Then the outline was made by pupil suggestions with the teacher writing them on the board. During this time the filmstrip was referred to any time it was necessary. After the outline of the raccoon was finished, time was given for the children to copy it. It was decided that plenty of space should be left for additional information from other sources. Upon completion, the outlines looked like this:

Beaver

I. Appearance

A. Size

Two feet or more in length

Largest of all rodents or gnawing animals

B. Color

Long reddish brown outerhair

Soft brown underhair

II. Characteristics

A. Body

Broad, flat, 10-in. tail covered with scaly skin

Uses tail as rudder and prop

Small eyes

Short ears

Two front cutting or incisor teeth in each jaw

Small front feet, larger webbed back feet

Second toe of each hind foot has a double claw

B. Habits

Intelligent

Hardworking

Live in colonies and work together

Can remain under water for 11 minutes

III. Homes (lodges)

A. Where

In or near bodies of water

- *B.* Materials used
  - Tree branches and mud
  - First builds dams to obtain water supply
- *C.* Type
  - In and above the water with at least two openings under the water
- *D.* Size
  - Sometimes ten feet across and three feet high

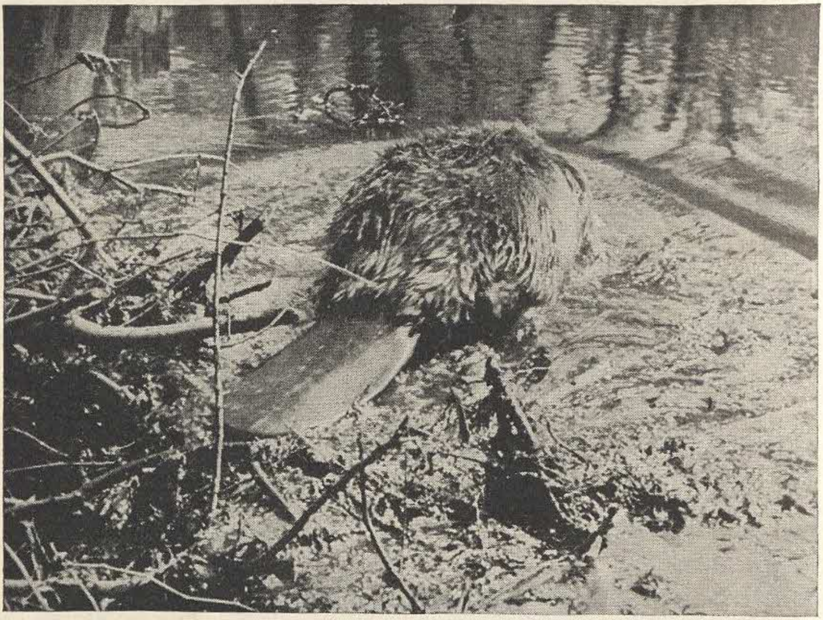

FIG. 5. This beaver is working on the dam with his broad flat tail. (*Encyclopaedia Britannica Films Inc.)*

IV. Food

- *A.* Foods eaten
  - Bark and twigs of poplar, willow, aspen, and birch
  - Autumn harvest stored in the lodge
- *B.* Classification
  - Herbivorous

V. Protection

- *A.* By nature
  - Builds homes in the water with openings under water
  - Warns others by slapping tail on ground or in water

- *B*. By man
    - State game laws

VI. Young

- *A*. Name
    - Kittens
- *B*. Number
    - Four to eight
- *C*. Other facts
    - Can swim when 2 weeks old
    - Lives with parents for 2 years
    - Third year finds mate and builds own lodge

VII. Usefulness

- *A*. To man
    - Valuable for furs
- *B*. To nature
    - Conservationist
    - Builds dams in streams so moisture is held all year
    - Sent to regions by man for this purpose

A period was spent in the library reading stories about these mammals. For the next few weeks it seemed stories of the common animals became favorite reading materials for the class. Nearly everyone had found pictures to go with their outlines, and those who could not find pictures were sketching them from some copy brought by a classmate.

As the filmstrip was only a small part of the presentation, the children were asking to hear and see the film again in order to check their outlines. The following review gave them definite ideas on what to check:

1. Were the homes of the animals described correctly in your outline?
2. Were the characteristics listed in your outline the same as those given in the film?
3. Could any more information be found about the young?

Immediately following the second showing of the film a discussion was held to see that facts were put in the outlines in the proper places and that these facts were accurate.

FIELD TRIP

The pamphlet, "Illinois Mammals Today and Yesterday," was used as a part of a blackboard poster which read, "Would you like to visit our Illinois State Museum?" This booklet contains photographs of the animals in the museum and a story about each. Some of these pictures were shown by means of the opaque projector and stories were read to the class. "Would you like to check the facts in your outlines by actually looking at animals in their natural setting?" "Did you know that some of the animals in the museum have become extinct, but by studying them we can tell something about the history of our country?" Naturally everyone was interested in making plans for this trip.

During the discussion of the above questions, the following objectives were formulated:

1. To see all Illinois mammals in a proper setting, thereby giving ideas for making habitat groupings.
2. To check facts already in their outlines for making habitats.
3. To become acquainted with mammals that have become extinct, thereby learning something about the past of this region.
4. To give training in organizing and planning a field trip.
5. To give practice in oral reports to the class.

"What day would you like to go?" It was decided they should go on Tuesday in order that they could have three days in which to make their habitat groupings.

Motions were in order for the selecting of committees for planning the trip. The following permission blank was filled out by the teacher and principal and sent to the Audio-visual Director.

Peoria Public Schools

Field Trip Bus Request

School ____________________ Teacher ____________________

Place to be visited ____

Grade _____ Date of visit ________________ Number of pupils _____

Date of this request ______________________ Principal's signature

____

The children selected a committee of two to distribute and collect the following parent-permission blank:

Peoria Public Schools

Permission Blank for Pupils Taking Field Trips

I give my consent for ______________ to go with ______________
Pupil Teacher

on a field trip to ______________ on ______________
Place Date

Parent's Signature ______________ Date __________

A road committee was selected to mark the route on a map for the bulletin board and to point out points of interest to the class along the way. As an entire day was needed for the trip, the committee decided everyone should take a sack lunch to be eaten in a park.

The study committee, consisting of the teacher and three pupils, studied the pamphlet and listed the animals not included in the pupils' outlines. These were listed as follows:

Animals of the Past in Illinois

1. Earliest animals–invertebrates
2. Animals of the Coal Age
3. Musk-oxen, wolves, big beavers, deer, elephants or mammoths before the coming of the red men
4. Bison or buffalo
5. Moose
6. Wapiti
7. White-tailed deer
8. Black bear
9. Mountain lion

Other Animals to See Not Included in Our Outlines

1. Mole
2. Brown bat
3. Weasel
4. Skunk
5. Timber wolf
6. Bobcat
7. Chipmunk
8. Squirrel
9. Mouse
10. Muskrat
11. Rat
12. Rabbit

Each child was asked to select one of these groups or animals for a short report. A period was allowed in which to prepare these reports. Each pupil had an idea from his past study of the common animals just what was important enough to bring to the class. The pictures from the pamphlet and from other sources were used in the opaque projector with each report. The reports were short but interesting.

Taking the Trip

It was now time for the class members to select the animal they wished to make and place in a miniature habitation of its own. The entire class was divided into eight organized groups, each group titled with the animal of its choice. Before going, each committee studied the outline of its particular animal, and each member was assigned a part of the outline to check at the museum. As the group left the schoolroom, a pupil checked each child to make sure he had his outline.

Upon arriving at the museum, everyone was checked for outline and pencil as he left the bus. Great interest was shown at the exhibits, the general conversation centering around the facts given in the class reports. Naturally, much of this interest was due to the pupils' previous knowledge about the animals. Ample time was provided for a study of other animals, as well as their own. Everyone had a good time and felt he was ready to start work on his chosen project when he returned home.

Constructing Habitat Groupings

It was decided that cardboard boxes 24″ x 36″ should be used by each group for the setting, and, if possible, the animals should be about one-half life size. Papier-mâché was to be used in constructing the animals. This work was not new because the pupils had done it before. They knew how to crumple paper and tie it in the form of the animal's body and to cover and complete it with strips of brown wrapping paper. These were painted and shellacked. Backgrounds were painted on brown wrapping paper to be placed in the boxes. Branches were brought in and construction paper leaves were made and attached. Whenever possible, homes for the animals were made. The beaver lodge was one of the most clever, being constructed in sections to show the inside; its underwater passages were covered with glass to represent ice.

The class invited other rooms to see its museum, and, of course, all of them came. At each habitat were boys and girls, specially chosen by the class, to explain the exhibit and answer any questions raised by the visitors.

TESTING

CONTEST WITH MOTION PICTURE

A contest was based upon the film, "Common Animals of the Woods." The teacher called out a number, and all scenes pertaining to that animal were shown, with sound off. The children watched the scenes and when the projector was stopped, wrote down the name of the animal beside the number given. This was done throughout the entire film. Naturally, the pupils greatly enjoyed this contest. Too, as an examination, it gave the teacher an evaluation of the work done.

MATCHING TEST

The following are illustrative of the items used in a final matching test:

Example:

(3) Raccoon

1. ( ) Beaver
2. ( ) Mink
3. ( ) Opossum
4. ( ) Woodchuck

1. An intelligent hardworking animal known for his skill in engineering.
2. Sometimes called a groundhog.
3. An animal that man seeks for his fur; one which is usually very destructive to other animals.
4. A long, sleek animal which lives by fishing.
5. Named for a habit it has, but actually it becomes so frightened it faints when in great danger.

LIVING IN ANCIENT GREECE

SIXTH-GRADE HISTORY

Introduction: Interesting the pupils in Greek history was easy because the children had been studying the climate, location, and physical features of Greece. They understood how these features and conditions favored the rise of a great civilization whose culture influenced all nations throughout succeeding ages.

Motivation: What method of motivation would be best to use in the study of a civilization which gave us many gifts? A committee examined source materials in the audio-visual library and selected a filmstrip, "Growing Up in Ancient Greece" (Teaching Films, Inc.). While the instructor was previewing the filmstrip, she kept in mind the question of how this could be used in the study of Greece; how it might be utilized as motivation to stimulate additional interest in Greek history. She then showed the filmstrip to the class and told short stories or asked questions to arouse curiosity in whatever topics the film suggested. Following this, the children with guidance selected topics of their own for further study.

Objectives:

1. To establish a desire in every child to read stories of Greek life and religion
2. To have the pupils read these stories and learn to appreciate that much of what we have today was given to us by the past
3. To prepare reports and assemble a notebook about ancient Greece
4. To reflect these facts and activities in a program for the mothers—provided the children maintained sufficient interest in the project

FILMSTRIP

Pupils Establish Their Objectives

One of the class members threaded the projector before the beginning of the class period while another placed a world map near the screen.

The teacher conducted the class as follows. She told the pupils they were going to see a filmstrip showing life as it was in Greece from 445 to 431 B.C.—the greatest period in Greek history. Who could find Greece on the map? One of the pupils located Greece. The group compared its location to those of Egypt and Mesopotamia, two great centers of early civilizations which had been previously studied. As they viewed this film, the pupils were to find some phase of Greek life that interested them and use it for further study.

The members of the class viewed the filmstrip scene by scene and discussed what they saw. The following will illustrate these discussions:

Scene 1

Some of the girls became interested in the strange clothing and furniture shown in the Greek pictures. "Did the strange dress of the mother have a special name?" "What kind of material was it made from?" "Who wove the cloth, or did it come from some other land?" "Did men and women dress alike?" These were some of the questions asked. One of the girls chose "Greek Clothing" as her topic for further study. Another chose "Greek Furniture." The teacher listed on the blackboard the name of person and subject chosen.

Scene 2

A number of students were curious about the home in which Diontes lived. Someone suggested "Architecture" as a topic. The teacher showed the class a picture of the Parthenon and explained that it was one of the most beautiful buildings in the world. She also told how today our architects use many of the Greek ideas in plans for buildings. A committee of four pupils chose "Greek Architecture" for its topic.

SCENE 3

Diontes went to school with his faithful slave. "Did everyone in Greece have slaves?" "Later, did they free their slaves as was done in our country?" "Where did the slaves come from?" "Did the slave serve his master for a lifetime?" "Were there many slaves at this time?" "Slavery in Early Greece" became another topic.

"Where did the boy go to school?" "Did his sister go with him?" "What did he study?" "At what age did he start?" "What language did he speak?" A boy and girl chose the topics—"Education of Boys in Greece" and "Education of Girls in Greece."

SCENE 4

The class discussed physical training for the boys, and, naturally enough, the Olympic Games. Three boys selected this topic. One would report on "History of the Olympic Games," another on "Place and Time of Olympic Games," and the third would tell about "The Contest—Yesterday and Today."

One boy chose "Transportation" as his topic.

SCENE 5

Dionte's dream of winning an Olympic contest reminded the pupils of Greek heroes. The teacher listed five men of importance and told several interesting facts about each one. The five pupils who chose these heroes for their reports planned to work together and also to discover other great men who played an important part in the life of the early Greeks.

SCENE 6

At twenty-one years of age Diontes received his shield and so became a citizen of the state. "What did it mean to become a citizen?" "Who could be a citizen?" "What kind of government did the Greeks have?" "Was this government the same in Sparta and Athens?" Two pupils chose to work on this topic because of the great differences between the two city-states of Sparta and Athens.

SCENE 7

Dionte's desire to have poems written in his honor brought up the idea that one of the greatest storytellers of all times lived in Greece. His name was Homer and his stories, the Iliad and Odyssey, are studied today. So one pupil chose the topic, "Homer and His Stories."

SCENE 8

A lyre was hanging on the wall. "What kind of a musical instrument was it?" "Did the Greeks have any other types of musical instrument?" "Greek Music" became the topic of another pupil.

SCENE 9

In the evening the family went on the roof. The pupils wondered if these early Greeks had other entertainment; here was an opportune place to mention the Greek drama. The class was interested in plays. The teacher told them that when Greece was in all her glory most of the writings were in the form of plays. "About whom were their plays written?" "Were there actors and actresses as today?" Two class members selected "Greek Drama."

"Did the Greeks have churches?" It was explained that Greek religion was different from ours; instead of one God, the early Greeks had many gods and goddesses. A committee of three pupils decided on the topic, "Greek Worship."

LIBRARY WORK

After one period of research in the library, the class spent another period in arranging their topics into a definite schedule. This schedule was as follows:

LIVING IN ANCIENT GREECE

1. Origin of the Greeks
2. Early history of Greece to about 450 B.C.
3. Government
   In the city-state of Athens
   In the city-state of Sparta
4. Greek worship
   Gods and goddesses
   Myths
   Oracles

5. Greek clothing
6. Slavery in Greece
7. Education of boys
8. Education of girls
9. Greek music
10. Olympic games
    - History
    - Place and time
    - The contest
    - Olympic games today
11. Architecture
    - Styles of columns
    - Acropolis
    - Parthenon
12. Drama
    - Theaters
    - Plays
    - Writers of drama
13. Homer
    - Life of Homer
    - Iliad
    - Odyssey
14. Heroes
    - Phidias, the sculptor
    - Pericles, the great ruler
    - Aeschylus, Sophocles, and Euripides—the poets of tragedies
    - Aristophanes, writer of comedy
    - Herodotus, the historian
15. Greek wars
    - Greece and Persia
    - Sparta and Athens or Peloponnesian War
    - Greece and Rome

The pupils spent several periods in the library doing research and making notes on their readings from which notes they wrote their reports. When completed, each report was turned in for the teacher's corrections and suggestions. The instructor held conferences with each student or group to help them in any way that seemed necessary. The art instructor explained the Greek use of the egg-and-dart design and each pupil worked out a design title for his booklet. One of the girls turned in this report, which she illustrated by means of the opaque projector:

GREEK CLOTHING

"The clothes of the Greeks were simple. The gentlemen wore a chiton or long skirt of linen or wool and over this a nearly square, white or colored, cloak. This cloak was draped from left to right. The men never wore hats unless it was raining or they were out in the hot sun. Shoes were not considered a necessity unless a person was making a long journey. Very seldom were sandals worn in the house. A gentleman must always carry his walking stick and seal ring.

"Women wore chitons with sleeves, and over these they wore long, straight himations. Himations were used as wraps when the weather was cool, and women usually covered their heads and faces with them when they went out on the streets. Sometimes nets and bands were worn around the head. Greek women were fond of jewelry and wore rings on their fingers, in their ears, and around their ankles.

"Small boys wore few pieces of clothing unless it was cold. The girls wore long dresses."

After each child gave his report, the instructor listed two or more important facts from it on the blackboard. At the end of each period, the pupils copied all these facts from the blackboard into their notebooks.

REVIEWING FILMSTRIP

After all reports had been given, the instructor again showed the filmstrip, "Growing Up in Ancient Greece." This time the children were capable of carrying on a very interesting free discussion of Greek life. They were proud of their knowledge. So proud, in fact, that they decided to have a Greek program for their mothers.

PLANNING THE PROGRAM

Because the class had shown much interest in the columns of Greek buildings, someone suggested they draw one style of column in miniature, cut it out on double paper and write the invitation on the inside. Because in the construction of the Parthenon Pericles chose the Doric style column for its strength and simplicity, the class chose this style for the invitations. The invitation was as follows:

The sixth grade invite you to their Ancient Greek program
Friday at two-thirty in room 15
We shall turn back the hourglass of time more
than two thousand years
To show how a few of our ideas originated.

The class planned a mock radio-television program. The boys constructed a microphone; the stage was to be the television screen. To create an atmosphere and setting for this program, the class constructed a Greek temple in the front of the room. They drew four Doric columns 6 ft. high for the pillars and a triangular portico to fit above these pillars. On this portico, they drew chariots, soldiers, and Olympic contestants. They placed the film screen between the center pillars. On either side of the screen were chairs for those who took part in the program. The Greek booklets were placed in an interesting display on the bulletin board.

THE PROGRAM

The great day arrived. The children took their places. The announcer, seated at the table, introduced the program by turning back the sands of time, using a 2-minute hourglass, with each minute representing one thousand years. One number, a report on Greek music, will illustrate.

As the story of Greek music was told, different members of the class played on the piano, accordion, and flute. In connection with the filmstrip[6] each instrument had a part in telling the story.

In introducing the final number, the announcer read the following:

OUR THANKS TO THE GREEKS

"To the Greeks of the past who had a culture that has influenced and benefited us through the ages:

"We wish to thank you for sowing the seeds of a democratic form of government; the idea which has made our country one of the greatest in the world. Like you, we know we must be clear thinkers; so we have schools in order that every person can have a chance to become a better citizen. To you we are indebted for the beautiful sculpture and the beautiful buildings you left for us to copy and study. Too, we are grateful for the plays, essays, and history writing you left for us. Thanks to the Ancient Greeks for the wonderful gifts."

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[6] It was not necessary to shut out all light; the black-and-white filmstrip was very successfully used.

The program was a real success. Parents were amazed at the freedom with which the children talked of an ancient civilization and at their knowledge and appreciation of Greek culture.

SAFETY

GRADES FOUR, FIVE, AND SIX

Origin of the lesson: During play periods many accidents had occurred on the playground. No one seemed safety conscious. One day two fifth-grade pupils were hurt. One was knocked unconscious by a thrown ball bat during a game, and another, while running, slipped on a rock, fell, and broke his arm. The fifth graders were quite concerned about these accidents. They realized that playing safely was an important problem for everyone in school. After a short discussion, someone suggested that it would be a good idea to preview the safety films in the library and choose one to present to the intermediate grades. The teacher ordered the materials and previewed them with a committee chosen by the class. The film selected was "Let's Play Safe" (Los Angeles City Schools).

OBJECTIVES

The committee's objectives were to help each person on the playground:

1. To become alert
2. To be careful
3. To be courteous
4. To be considerate of others

The committee held that if everyone would practice these four ideals, there would be no broken arms or other serious accidents. It accepted the responsibility of working out a plan that would accomplish these objectives.

METHOD OF PROCEDURE

The committee decided to use the sound system for reaching the fourth, fifth, and sixth grades. It worked out a series of statements and questions to be used in a broadcast before showing the film in the auditorium. In this broadcast, the chairman explained the program and introduced the following characters, each of whom said enough about himself to interest the group: Wrong Donkey, Giddy Goose, Foolish Fish, Pushy Pig, Dumb Bunny, and Mock Monkey.

BROADCASTING INTRODUCTORY PROGRAM

As the sound system is located in the principal's office, the program originated there. The principal was very much interested in the success of the program and spoke a few words before the members of the committee read the original script.

Chairman: Have you been hurt on our playground? Have you been responsible for hurting someone on our playground? We, the pupils of the fifth grade who have been hurt and who have been responsible for accidents, feel that all of us need to do some serious thinking about playground safety. Will you help us in a safety campaign to make our playground a safe place to play? Our room chose a committee to find a motion picture that showed how we can do this. In just a moment you will hear about some of the characters in this film. Think! Are you acting like one of these strange characters? Listen closely to them and then you will be invited to the auditorium to see them.

Wrong Donkey: I have been a Wrong Donkey because I didn't think. Some days there are many Wrong Donkeys in our halls and on the stairs. Wrong Donkeys get hurt and hurt others. Watch the picture and see if you have ever met a Wrong Donkey on a corner. Remember I haven't intentionally been a Wrong Donkey, but I just didn't think. What about you?

Giddy Goose: Can you guess what bad habits a person has to be called a Giddy Goose? Well, a Giddy Goose just doesn't pay attention to where she is going. In this picture, Mary came near to being a Giddy Goose. Watch her and remember being a Giddy Goose is dangerous.

Foolish Fish: I am Billy, the Foolish Fish! I do not have many friends. All the time when I think of myself first, people just don't like me. It isn't pleasant being a Foolish Fish. I hope you are never a Foolish Fish.

Pushy Pig: You can guess why I have been called a Pushy Pig. A Pushy Pig is never courteous. Watch me in the picture and see if you think anyone likes a Pushy Pig.

Dumb Bunny: You've heard of a Dumb Bunny! I'm just about the worst you've ever seen. If you are like a Dumb Bunny, change your ways immediately. No one really needs to be a Dumb Bunny.

Mock Monkey: We have Mock Monkeys in our school. You probably never think of yourself that way. Too, maybe you have never been one. I hope not.

Chairman: You have heard the characters or something about each of them, and now you will see them if you will come to the auditorium. Think while you are watching this picture. Let this experience help us to be more careful to think of our safety and our playmates' safety.

Four words given in this picture will be our guards. One begins with the letter "a" and the three other words begin with "c." When you return to your room, will you have someone print these four words on the board? A member of our committee will check to see if you have them. Let each of us use these four guard words and make our play more safe.

The three classes met in the auditorium and saw the film "Let's Play Safe." They seemed to like the picture and from general conversation each student came from the auditorium with clear ideas about safety.

OUTCOMES

Each class discovered the guard words "alert," "careful," "courteous," and "considerate." The sixth-grade art class printed these words in two-dimension letters and placed the posters in all the halls and rooms of the building. The fourth and fifth grades enlarged the posters of the characters that came with the film. The committee was responsible for placing these on different bulletin boards in the building.

The fifth-grade committee kept a careful record of all accidents and compared it with the accident records kept by the teachers previous to the safety program. This comparison showed that the number of accidents on the playground decreased sharply. The fine safety record and the fun the children seemed to have in making their playground a safe place were sufficient checks for evaluating the work.

REVIEWING FRACTIONS

SIXTH-GRADE ARITHMETIC

Material used: Film, "We Discover Fractions" (Coronet Instructional Films)

OBJECTIVES

After twice previewing the film, the teacher decided upon the following objectives:

1. To review the meaning of fraction
2. To teach the meaning of numerator and denominator
3. To teach the meaning of a fraction derived from a whole

4. To teach the meaning of a fraction derived from a unit
5. To create definite objectives for viewing the film

PROCEDURE

The sixth grade had reviewed addition, subtraction, multiplication, and division. They were ready to review fractions. The instructor asked questions to stimulate interest in the review that would be given in the film.

"Have you ever used a hammer and saw to build something? Today you are going to see a film showing boys and girls making things. You won't be told what they are making, but these people know how to measure wholes and parts of things. You have your rulers—Do you know ½ inch, ¼ inch, and ¾ inch? If you will watch closely, you will see how Jimmy's father explains the meaning of these fractions.

"What is a fraction? The film explains the meaning of this word. Do you remember what number of the fraction is called numerator? Denominator? If you have forgotten, watch Janie when she bakes the cake. These terms will be explained.

"Sometimes we take many things and divide them into parts. Johnny did this with something he took to school. He was sure he was right when the story was written on the board."

The teacher listed the following words on the board for study and discussion:

fraction
numerator
equal
inches
measure
part
consider
lumber
denominator
whole
feet
objects

Those which could not be defined were checked for special attention when the film was shown.

The teacher put these questions on the board to be answered after the class saw the picture:

1. What is a fraction?
2. What term is applied to the total parts the thing was divided into?
3. What term is applied to the number of parts we have now? What number of the fraction shows this?
4. Can parts be divided into parts? What does ½ mean?
5. When do we use fractions?
6. Can you write fractions?

The film was shown without interruptions. Then the class spent some time discussing the questions on the blackboard and finally took this short quiz.

Quiz

1. Fraction means ____________.
2. In the fraction ¾, the numerator is _____ and the denominator is _____.
3. In the fraction ⅚ of an apple, the _____ means the apple was originally cut into _____ pieces and we now have _____ of the original pieces.
4. Inches divide a foot ruler into twelve equal parts. Each part is _______ of the ruler.
5. Jimmy measured the board in _______ and _______.

From this presentation of illustrative core and individual lessons it should be quite apparent that the possibilities of utilization of audio-visual aids are limited only by the knowledge, insight, and initiative of the teacher. The aids are available for almost any kind of intermediate setting. Further, because of his previous experience in the primary grades where the aids' philosophy and practice have long been established, the middle-grade pupil is suitably conditioned for them. His attitude, based upon this previous experience, will be good, and the teacher will find him ready and eager for additional experience. In short, the possibilities for use and the pupils' attitude combine to make the intermediate grades a most favorable setting for the utilization of audio-visual aids.

See the references at the end of Chaps. 16 and 18.

16

USING AUDIO-VISUAL AIDS IN THE UPPER GRADES[1]

More complex and complicated aids can be used in the upper grades because pupils of these grades are somewhat more mature than those of the lower grades; they have had more experience with people and things in general, both inside and outside of the school; they can read better and think more clearly; and they can more easily recognize and appreciate the purposes of the particular aids, and thus interpret and utilize them more intelligently. Too, there is greater opportunity for a wider variety of individual activities–selecting, collecting, designing, making, originating, and planning. In the upper grades there is more continuity in lessons than in the lower grades; units are longer, and breaks between sections of particular topics are greater; hence possibilities of reference to preceding work and illustrations are more numerous and varied. More extensive fieldwork, in both length of trips and breadth of objectives, is possible.

A school's chief function is to help the child achieve a well-rounded, useful, happy life as a member of society. It must strive to give children experiences which will be meaningful in the activities of life. If one of the main functions of education is to help students learn to live together harmoniously in a democracy, then the interdependence of man and the contributions each individual should make to the social order must be stressed. The materials themselves are, of course, only means to an end, as are the utilizations of aids. This functional philosophy of education will be more effective when the curriculum of the school is not broken down into segments that are isolated from one another.

The present chapter is built around several detailed plans in which audio-visual tools are effectively incorporated into units of study that represent cores of integrated learnings instead of limited areas in single separated subjects. Although the main emphasis in each case is upon a particular subject, the emphasis is broad enough to include and capitalize opportunities and materials in other closely related educational fields. For example, the first section (Peru) shows how a social studies unit may be very easily enlarged in such a way that the topic serves as a core, the other subjects springing from a study and understanding of it. In this study of Peru, informations, skills, and understandings will be gained from lessons that in actuality are English exercises and geography, art, economics, and science topics and projects. Transitions from one type of lesson to another are made with ease because the interests of the pupils have been encompassed and consolidated.

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[1] This chapter was prepared by Norma Barts, Educational Consultant, British Information Service, 39 South LaSalle Street, Chicago. Miss Barts, an experienced teacher and world traveler, was formerly Educational Consultant to the DeVry Corporation.

It is well to remember that, although a general field of study may be scheduled by the curriculum maker or the teacher, the interests of the pupils really direct the treatment of particular units, which treatment must be based upon the pupils' background of experiences and ideas. Hence, the details cannot be entirely decided upon until this foundation is located and, if necessary, rebuilt. Obviously, individual differences in a class can never be ignored.

PERU

The countries of South America have become an important part of the curriculum of our public schools. When such topics are taught, among our objectives are these:

1. To become acquainted with the cultures and customs of South American countries
2. To develop a desire to know more about our world neighbors and what they contribute to us and we to them
3. To understand the resources of South America
4. To foster the "Good Neighbor Policy"
5. To appreciate the problems of South American countries
6. To gain a clear conception of the manner in which people cooperate in making a living
7. To recognize the influence which geographic conditions exert upon any nation

This unit is planned primarily to secure these outcomes from the study of one country and also to illustrate how separate matter areas can be ignored in an integrated unit. Because the students more than the subject guide a unit, it is impossible to include all topics and all materials that might be utilized in this study program to achieve objectives such as are listed above. Further, in each teacher's situation different school and community factors necessitate different emphases, the inclusion or deletion of some methods or materials of instruction, and varying amounts of time for the topic. However, enough is included here to illustrate how subject-matter areas and types of audio-visual aid may be correlated and to suggest the means by which such correlation may be made in almost any field.

To prepare the bookshelves, bulletin boards, exhibits, and other activities that will be described in the following pages many ideas and materials were secured through this brief but by no means complete list.

LIST OF INSTRUCTIONAL MATERIALS AND THEIR SOURCES

American Association of University Women, Washington, D.C.	Booklets
American Junior Red Cross, Washington 13, D.C.	Inter-American correspondence
American Library Association, 50 East Huron St., Chicago 11.	Bibliography of books
American Masterpieces, 7121 Pine Ave., Bell, Calif.	2″ x 2″ slides
Chicago Natural History Museum (The Book Shop), Chicago 5	List of natural history stories
Consulate General of Peru, 10 Rockefeller Plaza, New York 20	Pictures, posters, leaflets, and so on
Corporacion Nacional de Turismo, Nicolas de Pierola 455, Lima, Peru	Maps, pamphlets, picture post cards, and so on
Denoyer Geppert, 5235 Ravenswood, Chicago	Maps
Grace Line, 7 Hanover Square, New York 5	"The Grace Line" and other leaflets
Harry Grubbs, 6060 Sunset Boulevard, Hollywood 28, Calif.	Films
National Education Association, 1201 16th Street, N.W., Washington, D.C.	Bibliography of books, and so on
Keystone View Company, Meadville, Pa.	3¼″ x 4″ slide material

New Jersey State Teachers College, Upper Montclair	*Pan Americana*, vol. 2: charts, exhibits, films, filmslides, graphs, maps, pictures, posters, radio scripts, recordings, slides and publications, 1942 The People of America, Their Origins, Beliefs, and Contributions to Her Culture: A tentative list of teaching aids on inter-cultural education, for all ages, 1945
Office of Inter-American Affairs, Commerce Department Building, Washington, D.C.	Bulletins, and so on
Pan American Council, 84 East Randolph Street, Chicago	
Pan American Good Neighbor Forum, 673 Broadway, New York	
Pan American Union, Washington 6, D.C.	Catalogue of films, bibliographies, of books, music, publications, and so on
Pan American World Airways System, 135 East 42nd Street, New York	Maps, pamphlets, and so on
Rand McNally and Company, 526 South Clark Street, Chicago	Maps
Society for Visual Education, 100 East Ohio Street, Chicago	Filmstrips
U.S. Office of Education, Washington, D.C.	Bibliographies and booklets, exhibit on a two-week loan from Division of Library Service (maps, pictures, books, realias as pottery, textiles, idols, products, and so on)
World Federation of Education Association, 1201 16th Street N.W., Washington, D.C.	Booklets, and so on

Books and booklets

"Along the Inca Highway" (Malkus)
"American Lands and Peoples" (J. Russell Smith)
"America's Southern Neighbors" (Johnson and Hancock)
"Down South America Way" (Cusack and Stumpf)
"The Growth of Nations" (Atwood and Thomas)
"Guano" (#39) (Chicago Natural History Museum)
"Humpless Camels of the New World" (#30) (Chicago Natural History Museum)
"Latin American Backgrounds" (National Education Association)
"Latin America Today" (Perdew)

"Mahogany, Green Gold of the Tropics" (#31)
(Chicago Natural History Museum)
"The Man in the Moon" (#16) (Chicago Natural History Museum)
"The New World, Past and Present" (Webb, Campbell, and Nida)
"Old Highways of the Incas" (Consulate General of Peru)
"Other America" (Swiggertt, Rippy, and Wilgus)
"Our South American Neighbors" (Carpenter)
"Our Southern Neighbors" (Neyer, Gray, Hancock)
"Peru, Land of Tradition" (Office of Inter-American Affairs)
"Poisonous Snakes of the Western World" (#12)
(Chicago Natural History Museum)
"Riches of South America" (Von Hagen)
"Rivers as Sculptors of the Land" (#20) (Chicago Natural History Museum)
"Southern Lands" (Barrows and Parker)
"The Sun and Its Work" (#99) (Chicago Natural History Museum)
"Volcanoes" (#34) (Chicago Natural History Museum)

OUTLINE OF ACTIVITIES (PROBLEMS AND EXPERIENCES)

Motivation can be accomplished by means of various devices on the first day of a study of Peru. A map of South America and one of Peru should be hung in the room. The bulletin boards can be covered with interesting and varied Peruvian pictures and charts. The reading table or the library shelves will contain a collection of books, pamphlets, and leaflets.

After members of the class have been given an opportunity to scan these materials, a socialized discussion must be directed to bring forth what information and ideas the class already holds of the people of Peru.

In most communities today there is to be found at least one person who has visited Peru. This individual may have been there while he was a member of our armed forces. It is quite possible to find a representative of a transportation or travel agency who can be invited to talk to the class. If a teacher is unable to locate anyone who will visit the class to speak of Peru, a short story about this nation may be chosen and read aloud to the pupils, thus stimulating their natural curiosity about foreign lands and people.

Soon it will be time to determine what specific information the pupils desire to secure from their study of Peru. While individual members of the class suggest topics, their recommendations for further research can be written upon the board. The completed outline may appear somewhat like this:

1. *The land geography of Peru*
   a. Size and location
   b. Climate

- *c.* Mountains, rivers, lakes
- *d.* Cities

2. *The people of Peru and their everyday life*
    - *a.* Language
    - *b.* Homes and family life
    - *c.* Food
    - *d.* Entertainment and games
    - *e.* Dress and manners and customs
    - *f.* Religion
3. *Transportation and communication*
    - *a.* Railroads
    - *b.* Highways
    - *c.* Waterways
    - *d.* Airways
4. *Natural resources*
    - *a.* Agricultural products
    - *b.* Forests
    - *c.* Mineral wealth
    - *d.* Birds, animals, snakes, plants, and so on
    - *e.* Exports and imports
5. *Cultural achievements*
6. *Conquest, colonization, and independence*
7. *Government*
8. *Problems*
    - *a.* Lack of educational opportunities
    - *b.* Unequitable distribution of land and wealth
    - *c.* Health conditions
    - *d.* Lack of capital
    - *e.* Earthquakes
    - *f.* Trends toward industrialization

When the outline is refined and reorganized to the satisfaction of both teacher and class, each pupil copies it as a permanent reference for the study of Peru. Each succeeding day each notebook will grow and become more complete through individual effort as well as through class activities. Until the unit is ended, the bookshelves will gather more and more publications, and the bulletin boards will be changed several times in order that pictures and charts which the students find or make may be displayed. In like manner an exhibit of specimens and objects of, or about, Peru may be collected and augmented from time to time. Whatever is displayed in the room must not only be brought to the attention of the class but also must be consolidated into the discussions and activities of the students.

Before most pictures are posted on the board, a class period or a special activity may be an outgrowth of its perusal. This pen-and-ink sketch (courtesy of Harry Grubbs, distributor of films) can be shown to the pupils as the question, "What title could be given to this picture?" is asked.

A Filmstrip Introduces the Andes

The Filmstrip, "Peru–The Andean Highlands" [2] has 35 frames; it can be divided rather logically into two parts. The first 17 frames present a study of the Central Railway of Peru and mining. The second portion of the strip suggests Peruvian phenomena that will be considered early in any study of this country. A teacher's manual that accompanies this aid contains information to help the instructor identify each scene, but it is also necessary to prepare a set of questions that will be asked as the pictures are thrown upon the screen. Each frame may remain upon the screen as long as required for the class to thoroughly see, understand, discuss and interpret its various elements.

It is not always possible or desirable to project every picture of filmstrip. Since there is a danger in using too many picturizations at any one time, frame 18 of this strip could begin one lesson. In it Arequipa is shown at the base of El Misti. The students quickly identify the buildings as a town and the peak as a mountain. Possibly only one question, "What are the two most important elements in this picture?" brings forth that information. But many more facts about Arequipa and El Misti can also be gained from this frame. If a teacher says, "What can you find out about the town and the mountain from this picture?" these ideas are introduced into the discussion:

Arequipa
  Trees are palms
  Climate is dry
  Buildings are low and flat-roofed
  Town sprawls around the base of the mountain
El Misti
  Snow covers the peak
  Mountain influences the climate of the region
  It is old and has always dominated the town
  Altitude–17,934 ft.

Frame 19 takes the class to the top of Mount Misti. One pupil will quickly identify this crater, and the information in the teacher's manual allows the instructor to tell of the observatory maintained on its slopes by Harvard University for the study of heavenly bodies. (This can easily be the starting point for a science lesson, specifically one dealing with astronomy.)

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[2] Society for Visual Education, Inc., Chicago.

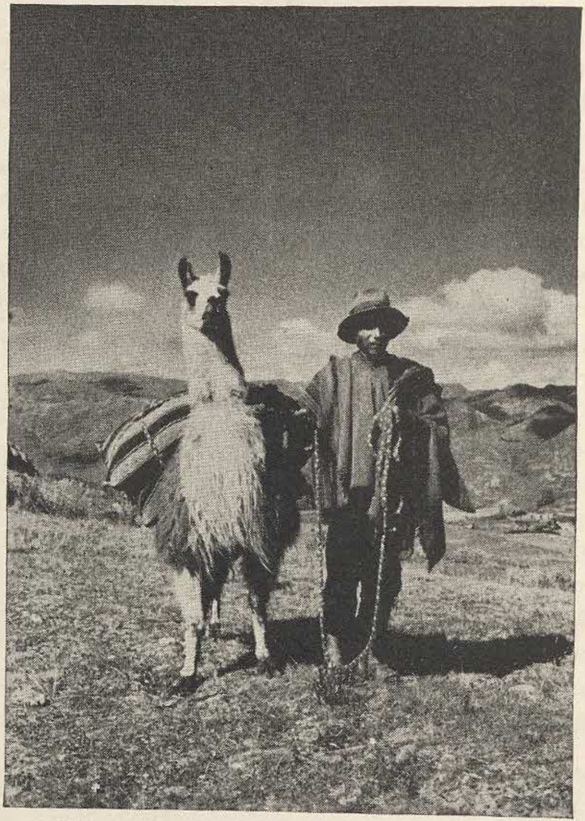

FIG. 1. Is this animal an alpaca or a llama?

"What further information about Arequipa does this picture give you?" is asked as frame 20 is focused. This question is so phrased as to stimulate students to get the answer from the picture. The formulation of the question demands thought and reasoning upon the part of the class. An association between what is seen and what is known induces conclusions that are truly meaningful.

Frames 21 and 22 can be compared; one shows the alpaca and the other, the llama. Questions such as these help students to contrast the two animals:

1. To what other animal are the alpaca and llama related?
2. Why does the alpaca remind you of the llama?
3. How does the llama differ from the alpaca?
4. Why do you find so many of these animals in Peru?

And so the study goes. Pupil participation can be very keen in any lesson centering around the use of still projected aids. Frequently only one query need be raised by the instructor; the awakened interest of the students will begin a very worthwhile discussion. For example, frame 26 shows a portion of the plaza of Cuzco.

The automobile and electric light and telephone wires are not as apparent as the church and other buildings of Spanish architecture. One prompting will center the attention of the class upon them, and soon a lively discussion about modern conveniences in Peru will ensue.

LANGUAGE ARTS LESSONS DEVELOP THROUGH A STUDY OF PERU

A very real curiosity will have grown now in Spanish words and pronunciations. This affords an admirable opportunity to introduce the Spanish language, its beauty, and its usefulness. A vocabulary enrichment lesson or two are needed before any film on Peru is shown to the class. Already, through their socialized discussions and readings, pupils are meeting many Spanish meanings. The class can suggest the words and phrases to be included in this vocabulary drill while one pupil writes them upon the blackboard. With dictionaries and other references pupils will set to work willingly to determine correct meanings, spellings, and pronunciations. The completed work will be somewhat as follows:

adios	ah-dee-os′	good-bye
Almagro, Diego	al-mah′gro, dee-ay′go	a Spanish captain who was Pizarro's partner
alpaca	al-pac′a	an animal with fine, long, woolly hair
Amazon	am′a-zon	largest river in the world
Andes	an′dez	mountain system of the west coast of South America
Arequipa	ah-ray-kee′pa	city of southern Peru
balsa wood	bal′sa	light strong wood
Bolivar, Simon	bo-lee-var, see-mone	Venezuelan patriot, liberator of Peru and other South American countries
Callao	kahl-yah′o	chief seaport of Peru
condor	kon′der	a very large American vulture found in the high Andes

Cordillera	kor-deel-yair'a	a mountain range
Cuzco	kooz-ko	ancient Inca capital
De Soto	da soo'toe	helper to Pizarro
guano birds	gwa'no	native bird and source of fertilizer
hacienda	ah-see-en'da	plantation or ranch
Humboldt	hum'bolt	German naturalist
Inca	ing'ka	an Indian who inhabits the highlands of Peru
Lake Titicaca	tee-tee-kah'kah	between southern Peru and Bolivia, at an altitude 13,000 feet
Lima	lee'ma	capital of Peru
llama	ya'ma	a domesticated South American animal
mestizo	mes-tee'zo	someone of mixed blood; usually a person who is part Indian and part Spanish
Peru	pe-ru'	South American republic
Pizarro, Francisco	pee-zahr'ro, frahn-sis'ko	conqueror of Peru
plaza	plah'sa	public square
Quechuan	ketch'wahn	the common language spoken throughout the Inca empire
señor	sane-yore	Mr.
sierra	si-er'a	ridge of mountains

An oral drill will help perfect accents and pronunciations. If this need is apparent, a recording or two can be brought into the classroom, and these Spanish lessons can be enlarged into a real foundation for a study of the language. It can easily become a game, however, to accent correctly the few Spanish words that are basic to a discussion of any South American country. This is also true about spelling. When the words are definitely related to the discussions and the readings of the class, the desire to spell correctly is greater.

MOTION PICTURES ABOUT PERU

Quite a few films on Peru are being distributed by film libraries. One series of one-reel, 16-mm., sound kodachrome motion pictures includes "People of Peru," "Plantation in Peru," "Farmers of the Andes," "Peruvian Plateau," "Source of the Amazon," and "The Incas."[3] These films all have a brief teacher's handbook to accompany them. Each of these subjects can be shown entirely independently of the others, or a series of lessons can be planned to screen all the films for the class. If a teacher has time to use only one or two of these motion pictures, the expressed interests and needs of the class will guide him to the topics that will best meet those interests and needs. For example, "Source of the Amazon" portrays the beginnings of this river in the Andes, its importance as a transportation route, the people of the region and their manner of living, Iquitos, the jungle capital, and the products of the river valley. The film, "The Incas," as its name implies, tells of this ancient civilization and its capital at Cuzco; it continues its lesson of archaeology and history with the story of Spanish conquest in Peru.

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[3] Produced by Harry Grubbs, Hollywood, Calif.

FIG. 2. Not all Peruvians are farmers.

Either of these films may be shown for several purposes, but if the class has as an objective an appreciation of the importance of the Amazon, then "Source of the Amazon" must be seen. When emphasis is placed on the Incan civilization and Spanish conquest of it, the film, "The Incas," will be screened.

"People of Peru" offers a fine introduction to the geography, the history, and the economy of Peru. Since pupils must be prepared in advance for the contents of any film, the teacher will aid the class to understand the purposes for seeing this film. Before projection and after preview by the instructor, students must know why they are seeing this particular film.

All the lessons that have preceded the showing of "People of Peru" relate to the screening of this topic. Nonetheless, it would be wise to begin this particular period with the question, "What do you already know about Peru and the people who live there?" The facts that the students divulge will formulate a pattern of those areas with which they are acquainted and those which are still hazy and unknown.

Next, the teacher brings forth a map of Peru (or of South America) to explain the three well-marked topographic regions which extend from the north to the south—the dry coastal plain or desert, the region of the Andes (Sierra) and the Montana, the tropical forested plain and jungle east of the Cordilleras and included in the basin of the Amazon. He, also, with the help of the class traces the history of this country—the civilization of the Incas, its conquest by Spain and the resultant blend.

The objectives, then, to be gained from a screening of this film are

1. To distinguish between the desert, the mountains, and the jungle of Peru and to understand how the geographic features of each of these sections affect the lives of the inhabitants
2. To become acquainted with the city important to each region—Lima, Cuzco, and Iquitos
3. To form a background for understanding the culture of Peru—Inca and Spanish influences

These purposes or objectives may be written on the board in outline form as questions, or presented in some other manner. If the teacher believes that the commentator of the film uses unfamiliar words, these should also be introduced to the class before it sees the motion picture:

rectangular blocks
culture
mestizos
accumulate
ancestry
descendants
primitive
standard of living

Perhaps the meaning of these words can be gained from the experience of seeing the film, but if this is not so, then the words must be explained to lend additional meaning to the film.

After seeing the film, the class returns to a consideration of the purposes for viewing it. The activities started before the film was shown must be completed.

A discussion of the importance of the Andes and the Amazon can be begun. The map of Peru is again studied and discussed; the information presented by the motion picture about topography of Peru is outlined:

1. The coast desert
2. The region of the Andes
3. The jungle and plain beyond the mountains

The pictures of the three cities, Lima, Cuzco, and Iquitos, will be built quickly. Each pupil can write a brief paragraph for his notebook on each of the cities. One thought can be uppermost–identification. Before this assignment is made, however, a pupil may tell in a few sentences about one of the cities without mentioning its name. Another member of the class will guess the city and then go on to describe one of the other towns. In a very short time most members of the group will have contributed to the general knowledge and understanding of Lima, Cuzco, and Iquitos.

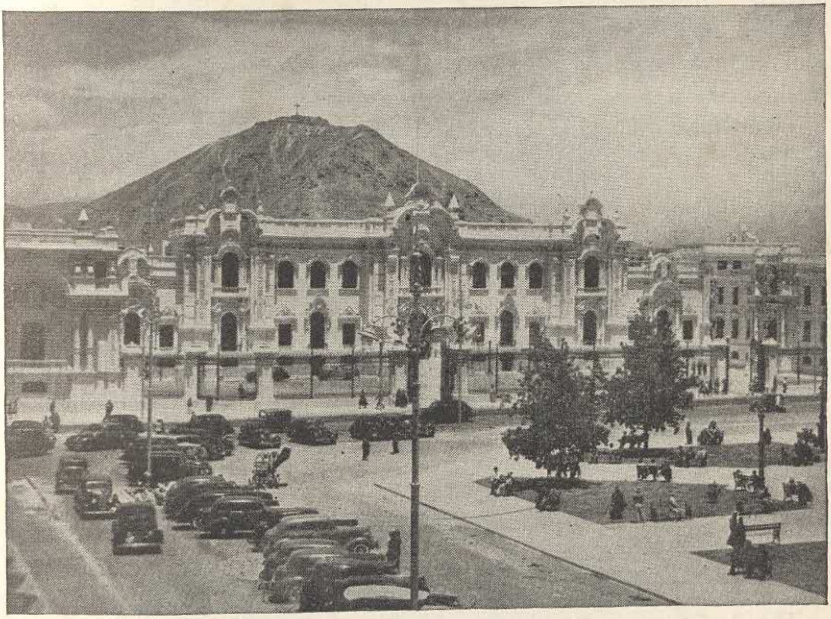

FIG. 3. A view of the plaza of Cuzco.

The pupils may be asked to list the contributions the Incas and the Spanish made to Peruvian culture. This can be accomplished in any number of ways, but it might be wise to list them on the blackboard:

Spain's Gifts to Peru
- Christianity
- Written language

Inca Heritage
- Terracing
- Irrigation
- Dry masonry stonework

The class could then be divided into two groups, each one to be held responsible for more information on either the Spanish or the Incas. An informal debate the following day will compare the contributions of both cultures and lead to a better understanding of present-day Peru.

In order to clear up miscomprehensions or in order to review the material again, the film may be shown a second time. For the second showing of the motion picture it is often wise to point out, explain, or emphasize particular parts of it. An instructor may even desire to run a sound film as a silent one; the teacher or the pupils may then speak during the showing of the film, discussing or questioning the activities depicted upon the screen.

When "People of Peru" is reshown, the maps at the beginning of the film need reemphasis. Since Peru can be divided into three distinct physical sections, the differences in the way the people in each region live must be pointed out. The distinctive features and geographic conditions of each area influence the people and their mode of existence, and this comparison can be made as the film is being reshown.

Geography Is Inherent in a Unit on Peru

Many geographic concepts can be considered while a study of Peru is progressing. Certainly, there is a definite place for the use of the flat map and the globe and for a study of the symbols that are found on them. Indirectly, as a class learns more about Peru, it can also further appreciate

Latitude
Longitude
Altitude
Sea level
Sea currents
Plateaus
Rainfall
Mountain ranges
River basins, valleys, and channels

The Andes are not within the borders of Peru any more than is the Amazon. Certainly Lake Titicaca brings Bolivia into consideration. Peru and its relation to other American countries can supplement a review of the geography of the Americas. Therefore, a general geographical review of Latin America can also spring from this study of Peru.

Graphs and charts are essential, too, in a comprehension of geographic terminology. These may be student prepared, teacher produced, or secured from regular sources.

It is possible to deviate into specific science lessons—astronomy, mineralogy, botany, zoology—when such considerations as the Harvard Observatory on Mount Misti or the use of llamas or the growth of plant life above the timberline arise.

Creating a greater interest in map study can be accomplished by assigning the production of a map to each pupil. Individual differences and talents may be capitalized if leeway is allowed in choosing the type of map to be made. A cooperative group of students could build a plaster relief map of Peru. Some individuals may prefer to make flour-and-salt contour maps. Boys with a carpentry knack like to paint their maps on wood and then cut them into jigsaw puzzles. Girls might prefer picture maps of industries, of products, or of animal life. Instead of maps, some pupils can form history time-lines. Whatever the type of map or chart project, the pupil gains a rich sense of achievement by producing an original piece of work.

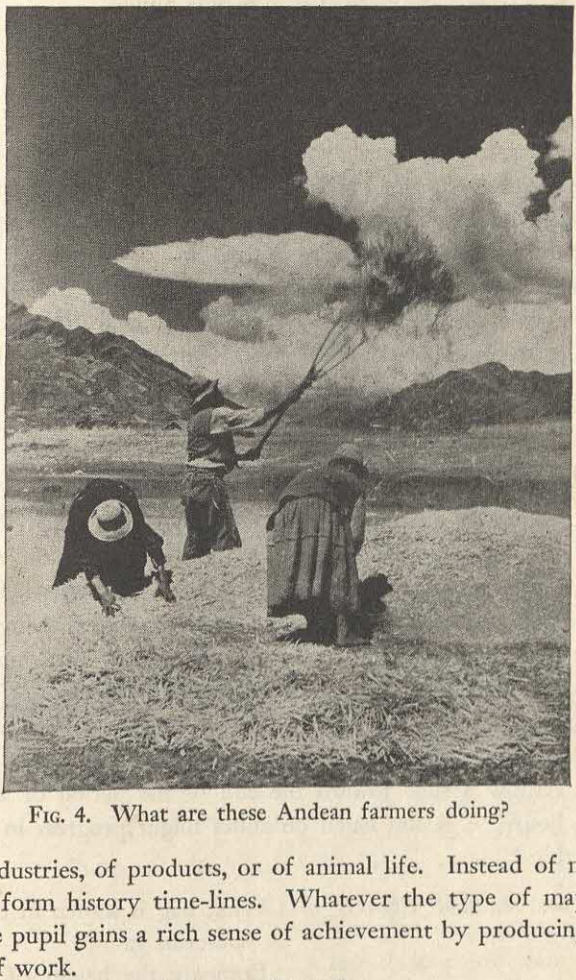

FIG. 4. What are these Andean farmers doing?

A SECOND FILM LESSON

In order to help the class gain a true appreciation of Peru and its people, the 16-mm. sound color film, "Farmers of the Andes,"[4] may be shown.

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[4] This film, as well as the others in the series, may also be secured in black and white.

Agricultural problems and methods will be studied before the motion picture is projected. At this time the class with charts and graphs learns how altitude and rainfall affect farming. Before screening the film, these questions are placed upon the board:

1. Why did the Incas terrace their farms?
2. From what materials do these plateau people build?
3. How is grain harvested and threshed in the Andes?
4. Describe a typical market day.
5. What did you learn of the people and how they live, work, and play?

When the film has been seen, the items on the blackboard can be reviewed. Into this post-showing discussion, pictures of agricultural machinery and forms of mechanization can be introduced. These will be compared with the methods depicted in the film.

The students may be asked to list the problems that the constitutional republic of Peru is facing. They may then be directed to particular books and pamphlets (collected and in the room), the study of which will help them understand these problems, suggest solutions to them, and indicate the part the United States will play in solving them.

Slides Are Good Tools for Detailed Study and Discussion

Students frequently interact with one another best when the room is darkened. All attention is centered upon the image on the screen, and each pupil is freed from the complete attention he attracts when he recites under the usual conditions. As everyone studies what is being projected, the teacher raises a question that may be answered by one pupil while all examine the picture on the screen. Although there are many 2″ x 2″ kodachrome slides in any one set, a teacher may choose as many as is desired and project them in whatever order best suits class purposes. It is also possible to reshow a slide toward the end of the period or at any time during the hour. A lesson based on slides might progress in some such fashion as this: [5]

Slide AS 94: Ancient Church in Arequipa	What flag is shown in the picture? Describe it. Compare the height of the people to the height of the church. Who do you suppose built this church?

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[5] American Masterpieces, 7121 Pine Ave., Bell, Calif.

Slide AS 92: Central Plaza	This picture tells you many things about the city. What are these facts? (Review question)
Slide AS 105: Llamas	Why does the llama remind you of the camel? How do the two animals differ? Compare the llama and the alpaca. In which of the three geographic divisions of Peru are these llamas? How do you know? (Review)
Slide AS 104: Indian Home	How were these houses constructed? Can you make a guess regarding the height or altitude at which these houses were built?
Slide AS 93: Misti from a Private Garden	Compare this home with the Indian house we just viewed. (Reshow Slide *AS* 104) Do you recognize the mountain in the background? Why do you suppose it is called "the old man"? (Review)
Slide AS 102: Peruvian Soldiers	What does this picture tell you about the army of Peru? Here is another opportunity to learn more about the people of Peru and the way they live. (Discuss)
Slide AS 110: Doorway at Ruins near Saccsahuaman	This is a fine opportunity to study the dry masonry of Inca stonework. In order to get an idea of the size and weight of these stones, use the man in the picture for contrast. (Discuss)
Slide AS 113: Ruins at Macchu Picchu	These ruins were not discovered until 1911. What clue does this picture give you concerning the reason these ruins were discovered only recently? (Discuss)

A Written Language-arts Assignment

It almost seems that oral rather than written English activities has been emphasized in this unit. This is not necessarily true because each pupil has been making additions to his individual notebook, completing the outline, enlarging the vocabulary list, and so on. Perhaps this is the place in the unit to embark upon a creative letter-writing project.

All the reading materials and the audio-visual aids that have been used by the class, the texts and supplemental books, the slides, films, and flat pictures have helped the students to an understanding of the Inca civilization that the Spanish found in Peru. Because the Incas never developed a written language and used symbols to a very limited degree only, they handed down their history by word of mouth. The Spanish who came to Peru, however, wrote letters home to their families and to their friends describing the land of the Incas. Each pupil may imagine he came to Peru with Pizarro or with a later group of Spaniards and write a letter to a relative or a friend in Spain describing what he has seen or experienced in the New World.

Many pupils will want to carry this project a bit further by actually corresponding with someone in Peru or in one of the other Latin American countries. The Junior Red Cross and other agencies sponsor inter-American correspondence.[6] Information may be easily secured, and soon new "pen pals" will take an active part in the Good Neighbor Policy of the United States.

ART ACTIVITIES GROW FROM A STUDY OF PERU

The artistic creativeness of the Incas is to be found in their textiles, pottery, and jewelry. By now students and the instructor have gathered many objects and pictures that suggest the designs and motifs of these ancient peoples. With the help of the art department the pupils express imaginatively and creatively their interest in, and their knowledge of, Peru. Clay can be molded into objects imitative of those made by the Incas. If facilities are available, these can be glazed and fired. Textile designs can be worked out in the proper colors and patterns. These may be developed on paper and even transferred to cloth. Some students may desire to make replicas that suggest Peru—an adobe hut, a sun temple, a church, or a mine.

Another means of correlating art work with a study of Peru can be found in the making of 3¼″ x 4″ glass slides. The Keystone View Company will supply kits which include etched glass, plain glass, tape for binding, colored crayons, and a booklet of directions. Often these materials can be bought locally. Most pupils already own, or the school can supply, the necessary pencils, ink, colored pencils, and water colors.

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[6] See pp. 178–181.

Glass Slides and Oral Reports

To begin a termination of this unit, each pupil may be asked to make a short oral report, illustrated by a homemade slide, upon some topic which has particularly appealed to him. A list of possible subjects such as the following may be suggested by the instructor:

Flag of Peru
Amazon
Andes
Lake Titicaca
Pizarro
Humboldt current
Copper smelting
Quipus
Sugar plantations
Iquitos
Arequipa
Coco-cocaine
Gold and silver
Terrace farming
Guano birds
Bolivar
Macchu Picchu
Lima
University of San Marcos
Cuzco
Peruvian Central Railway
Harvard Observatory on Misti
Forest products
Callao
Monetary system
Petroleum
Government of Peru
Pan-American highway

Each pupil will use the texts and the reference books to gather information about his topic. He will also try to make his glass slide original and artistic for it is the picturization of his subject. Naturally, his report should be given in an interesting and logical manner. It may be wise to teach the use of outlines in organizing information and some general public-speaking principles before the oral reports are presented to the class. Here again is an opportunity to coordinate a social-studies topic with an English exercise.

At the culmination of the unit, it should be possible to gather all the achievements of the class—notebooks, art work, maps, and so on—and display them at an "open house." A Pan-American program might also be considered. Whether this were a very simple project or a more elaborate one, the pupils would enjoy and gain from an opportunity to interpret their work for others—their parents or their schoolmates.

Conclusion

Several times in this description of a unit of study on Peru it has been hinted that there is a coordination with the broader purposes of the school. Various teaching materials and methods have been suggested, not as the only or the best means to teach this unit but as one possible approach to a study of this country. Peru is the core, but language arts, history, geography, health, economics, agriculture, art, science—all are parts of the whole.

The methods used in evaluating the pupil's work can be objective as well as subjective. Because the activities are varied, the evaluating criteria differ too, as has been indicated. If pupils are given a deepened appreciation of other peoples and their way of life, as well as a chance to carry on individual researches and present their findings to the class, then this study of Peru will be successful.

New problems can be raised, old ones may be altered, or new purposes may be set, but the unit must be evaluated in relation to the whole learning situation. Individual pupils may be guided, stimulated, and supervised to continue their study activities into any field of endeavor aroused by a particular topic or by the unit as a whole. This is a less direct outcome, but it is an important one.

Of course, this plan of teaching is the technique which a good instructor has always utilized. Using audio-visual materials in a correlated curriculum does not change basic classroom teaching purposes or procedures, but it does assist substantially in making learning more purposeful and meaningful to our pupils.

THE SYMPHONY[7]

Introduction: In the introduction of the unit on Beethoven's *Symphony No. 3*, the following slides were shown and discussed by the class:

1. Instruments of the modern symphony orchestra and band. The music of each instrument was illustrated by the use of records in conjunction with the slides.
2. Symphony study: (*a*) Haydn; (*b*) Beethoven; (*c*) Schubert.

Preparation:

1. Collected a number of pictures from magazines and books, illustrative of the lives of Napoleon and Beethoven and the principal and subordinate themes of the symphony to be studied. These were subsequently photographed and made into slides.
2. Copied certain themes of *Symphony No. 3* on the blackboard; pupils copied these in their notebooks.
3. Discussed in the classes the film "Life and Loves of Beethoven," which was to be shown in the local theater during the week of study and which the pupils were requested to see.

[7] By Onnolee J. Folts, Englewood Junior High School, Englewood, N.J.

4. Selected suitable records to be played in conjunction with the showing of the slides.

Procedure:

I. Review.
  1. Instruments of the symphony orchestra. Played several records identifying the various instruments as they were played.
  2. The form of the symphony. A discussion of the structural form of a symphony compared with the sonata. Pointed out the use of the principal and subordinate themes.
    a. Showed examples of the above themes by the use of slides, playing the selection on the piano at the same time.
    b. Had children copy themes in their notebooks.
      Exposition
      The development
      The recapitulation
    c. Played examples of the following from the Goettchins analytical edition of *Symphony No. 3* of Beethoven:
      Exposition:
      Statement of the principal theme
      Showed children principal theme
      Played and had children hum the principal theme
      Transition:
      The meaning of a transition
      Examples of transition illustrated on the piano
      The subordinate:
      Showed slides of the subordinate theme
      Played and had pupils sing or hum it
  Asked children to listen and observe the following:
  1. The principal theme closes with a definite perfect cadence (illustrated with slides).
  2. The subordinate theme—of equal importance to the principal theme and invariably presented in a different key (illustrated with a slide).
  3. Codetta usually heard as concluding theme.

II. A manuscript was prepared by the teacher and read to the class.
  1. The life of Beethoven. Children were assigned story and the viewing of the film "Life and Loves of Beethoven"[8] before coming to class, and were able to add many interesting anecdotes in connection with the life of Beethoven. The slides of Beethoven's life were shown and discussed. (Children are extremely interested if the pictures show the early life of the composer. It is important to make

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[8] Garrison Film Distributors, New York.

the composer alive and not to mention dates of his birth and death at this time.)

2. The part played by Napoleon Bonaparte and the admiration Beethoven had for him. Showed slides of Napoleon and discussed the history of this period. Discussed the effect of the time on Beethoven's music—major and massive chords.
3. Played *Symphony No. 3* of Beethoven on phonograph. As numbers were played, showed slides containing principal and subordinate themes.
   Repeated humming of themes.
   Pupils copied themes (melody) from the slides into their music notebooks.

III. Conclusion: The Poem "Beethoven" from "Music Notebook" by Lillian Van de Vere was shown by means of slides.

PATHWAYS TO THE PACIFIC [9]

I. Objectives. This unit will follow the study of the early trail makers over the Appalachians, by flatboat down the Ohio, and over the Cumberland Road to the Mississippi. The major objectives are

1. To develop an understanding of the westward movement
2. To show the part the pioneers played in the development of our country
3. To teach the historical facts connected with our country's growth
4. To show our land as a land of opportunity
5. To develop an appreciation of the greatness of our country
6. To develop a true spirit of patriotism

II. Audio-visual aids

1. Flat pictures
   "Pioneer Days" [10]
2. Maps
   "Progressive Growth" map
   Map showing routes of explorers
3. Miniatures for picture study
4. Films
   "The Story of Our Flag" [11]
   "The Pioneers"

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[9] By Madelon Lester, Principal, J. J. McNally School, Lewistown, Ill.

[10] Informative Picture Publications, Grand Rapids, Mich.

[11] Knowledge Builders, New York.

"The Gold Rush"[12]
"Pioneers of the Plains"
"Overland to California"
"The Oregon Country"[13]

5. Texts
   "Stories of My Country" (Ames, Ames, and Ousley)
   "America's Building" (Freeland, Walker, Williams)

III. Preparation

1. Preparatory background
   - *a.* Display flat pictures showing pioneer life.
   - *b.* Read to the class "The Flag Goes By." Discuss the pictures in the poem. Discuss the meaning of "more than the flag is passing by."
   - *c.* Read aloud and discuss "This Land is Ours" by Nona Duffy.
2. Aids used
   - *a.* Flat pictures
   - *b.* "Progressive Growth" map
   - *c.* Map showing routes of migration
   - *d.* List of topics in the film for which pupils are to watch:
     The flags of our country
     Surrender of Cornwallis
     Building westward
     Omaha to San Francisco
     150 years of progress
     Today
3. Word list

Constellation	Resolution
Galaxy	Alternate
Vast	Ensign

4. Question list
   - *a.* How did the flag of our country grow out of the flag of the mother country?
   - *b.* How does the flag show the growth of the nation?
   - *c.* How did the discovery of gold hasten the growth of the country?

IV. First screening of the film: "The Story of Our Flag."
Show the film without comment.

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[12] DeVry Corporation, Chicago.
[13] Encyclopaedia Britannica Films Inc., Wilmette, Ill.

V. *Discussion following first screening*

1. What was the first flag that represented the colonies as a whole?
2. What did the resolution by Congress say that the new flag should be like?
3. What is a constellation?
4. What was the "new constellation" mentioned in the resolution?
5. How many stars and stripes did the flag have when Francis Scott Key wrote "The Star Spangled Banner"?
6. What different modes of travel were shown?

VI. *Second screening*

1. Explain animation maps and ask pupils to watch for these
2. Assign topics (based on film) to individual pupils
    - *a.* Our Country's Flags
    - *b.* Building Westward
    - *c.* Omaha to San Francisco
    - *d.* 150 Years of Progress
3. Show the film
4. Discussion
    - *a.* Pupils review for the class the assigned topics.
    - *b.* How did the film show that the country was growing westward?
    - *c.* Do you agree with the statement made concerning our need for an army and navy?
    - *d.* Name some of the "flag makers" shown in the picture.
    - *e.* Describe some ways in which you can be a "flag maker."
    - *f.* Pupil-conducted "quiz program" on facts learned from the picture.

VII. *Matching test based on film*

—1. Louisiana Purchase
—2. A flag popular in New England
—3. The last two states admitted
—4. The birthday of our flag
—5. The gold rush
—6. The first flag of the united colonies
—7. The fourteenth and fifteenth states

a. New Mexico and Arizona
b. 1849
c. The Pine Tree Flag
d. Kentucky and Vermont
e. June 14, 1777
f. 1803
g. Cambridge flag

VIII. *Picture study*

1. The End of the Trail (Frasier)
2. The Coming of the White Man (Reid)

3. The Spirit of '76 (Willard)
4. George Washington (Stuart)
5. Old Santa-Fe Trail (Young-Hunter)

IX. Follow-up activities

1. History
   - *a.* Free library reading and reports
   - *b.* Handwork
     - Posters showing colonial flags
     - Five-pointed stars cut from folded paper
     - Original drawings showing historical scenes
     - Frieze showing modes of travel
     - Cutout progressive map showing westward expansion
     - Map showing routes of migration
     - Handmade slides—frosted glass and transparent crayola
     - Collection of flag pictures for the bulletin board
     - "Quiz Kids" program on "How to Display the Flag"
2. English
   - *a.* Writing a play—"Betsy Ross and the Flag"
   - *b.* Writing invitations to the parents to see the play
   - *c.* Presenting the program
     - The play
     - "Living Pictures"[14]
     - Betsy Ross and the Flag
       - Music—"The Star-Spangled Banner"
     - The Spirit of '48
       - Boy Scouts with the Flag
       - Music—"God Bless America"
   - *d.* Writing letters to the local D.A.R. asking for how-to-display-the-flag leaflets for the class
   - *e.* Writing a poem about the pioneers
   - *f.* The diary of the pioneer boy

X. Tie-up with the rest of the unit

The next phase of the unit will continue the study of westward expansion through the use of the films: "The Gold Rush," "Overland to California," "The Oregon Country," and "Pioneers of the Plains."

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[14] Modeled by pupils behind a large picture frame covered with tarlatan and lighted from above.

DUTIES OF CITIZENSHIP

A fine series of suitable transcriptions is available for classroom use. Dramatizations make these listening exercises especially appealing to teen-age students. "Democracy is Our Way of Life" introduces the series, and others are "Right of Citizenship," "Duties of Citizenship," "Democracy Can Be Betrayed," "By the Will of the People," and "Democratic Procedures Extended." The minor plots and stories that illustrate these principles are true episodes from our American heritage; they are readily adaptable to classes in civics and United States history.

PURPOSE OF THIS LESSON

Every adult and every child in the United States should feel a sense of responsibility toward his government; and he should recognize that he himself must earn the freedom of democratic life. The passage of the "Freedom Train" through the United States, and the discussions of solutions to our postwar problems reawaken the American assertion that "Democracy is Our Way of Life." Here is a brief lesson designed to foster these ideals. It is based upon the recording "Duties of Citizenship."

PREPARATION FOR THE TOPIC

A collection of photostatic copies and facsimilies of documents—the Magna Carta, the Declaration of Independence, the Constitution of the United States and its Bill of Rights, and so on, may be gathered as the school year progresses and, according to their size and form, may be framed, mounted, or prepared for use on the bulletin board. These materials should be displayed prominently in the classroom several days before the phonograph presentation. The exhibit will immediately attract attention, and pupils will begin to ask questions and talk about the documents.

"What does democracy mean to you?" is written on the blackboard in large letters to greet the pupils when they enter the room. If the teacher desires, the pupils may answer the question individually on paper and a sampling of the paragraphs be read aloud to the class to stimulate discussion. However, the question alone on the board is sufficient to "spark" oral contributions and interactions among the pupils. Although this discussion should not be teacher dominated, it must be teacher directed.

When it is evident that the boys and girls need help as they consider the "Duties of Citizenship," the transcription is introduced. This may be done in a simple way or in a more elaborate manner as suits a teacher's purposes. Here is one possibility:

"Perhaps our discussion will be stimulated by hearing a record. This transcription is entitled 'Duties of Citizenship,' and it will tell us of a Danish immigrant, Jacob Riis, who fully realized his duties as a citizen of the United States."

(The title of the transcription and the name of Jacob Riis are written upon the board. A slight digression may be necessary in order to ensure that each pupil understands the meaning of "immigrant.")

"Theodore Roosevelt called Jacob Riis 'the ideal American citizen.' Who was Theodore Roosevelt?" (Discuss)

"Let's listen to this recording and hear why Theodore Roosevelt called Jacob Riis 'the ideal American citizen.'"

COORDINATING THE LISTENING ACTIVITY WITH LANGUAGE ARTS

The instructor plays the record and at its conclusion as she lifts the needle from the disc, she asks again, "Why did Theodore Roosevelt say Jacob Riis was an ideal American citizen?" The ensuing comments and discussions of the pupils will include the duties of citizenship and the meaning of democracy.

The class is finally ready for the second question which will be placed on the blackboard: "How can students in school assume their 'duties of citizenship'?" As this query is written a minute before the end of the lesson, it is suggested to the class that the answer should be written briefly in the form of a composition and brought to class the following day.

These compositions may be read in class and, if desired, may also be further developed as written language exercises. For example, possibly one student's ideas, or a combination of thoughts from several pupils, can be organized into a dramatic skit. This dramatization can be refined and practiced to be worth presenting to the whole school as an assembly program. Another possibility is to give it in the form of a radio script over the public-address system, a presentation which resembles the transcription to which the class listened.

THE INDIAN [15]

This unit is based on the growth of our civilization in and around Canton, Ill. We give our pupils a background of the past, beginning with a study of the Indians and following with units on the explorers, the pioneers, the colonists, and Illinois and Fulton County. These units lead naturally into a sixth-grade study of the history of Canton. The four main emphases in the unit are

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[15] By Gladys Crouch, Canton, Ill.

I. What the Indian gave us: names, food, methods of fertilization, and general contributions—dances, music, pottery, and weaving.
II. Tribes in Illinois: Shawnees, Kickapoos, Sacs, Foxes, Miamis, Winnebagoes, Peorias, Cahokias, and so on.
III. Wild Life in Illinois: fowl, buffalo, deer, and so on.
IV. Plants: maize, roots, seeds, berries, fruit, popcorn, pumpkin, and squash.

The unit is correlated with

Geography, through a study of the Illinois Valley, soil drainage, and industries.
Reading, through Indian legends and stories, and "Hiawatha."
Art, through a study of pottery, rugs, weaving, Indian designs.
Music, through Indian songs, rote songs, dances.

LESSON TOPICS [16]

Lesson I: Introductory. General discussion, stereographs, books, pictures.
Lesson II: Organization of class into committees for study and reports on such topics as the following:

Appearance
Travel
Language
Weaving
Location
Trading
Medicine men
Religion
Shelter
Weapons
Games
Dances
Food
Music
Toys
Work
Clothing
Pottery
Education
Paints, dyes

Lesson III: Location. Using maps of United States, Illinois, and Fulton County

Lesson IV: Field trip to the Dickson Mounds near Lewiston (18 miles from Canton).

Plan the trip using highway maps of Illinois, tracing route from Canton to the Mounds. List names of villages through which we pass.

Impress upon the pupils that Fulton County was an important center of aboriginal Indian life. Tell how investigators from the University of Chicago and Illinois have excavated numerous places in order to make a study of these Indian burial mounds.

Explain how the valley we travel through was at one time heavily wooded and that the Indians made their homes here. Large lakes covered the floor of this valley: Thompson Lake can still be located. The bottoms were covered with fields of wild rice, which furnished food to thousands of wild ducks and other fowl; clams and fish were abundant, and hence food for these people was plentiful. The Illinois River offered a natural highway for canoe travel. This region represented an ideal location for the Indians.

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[16] "Lesson" refers to a section of the unit and not to a daily recitation.

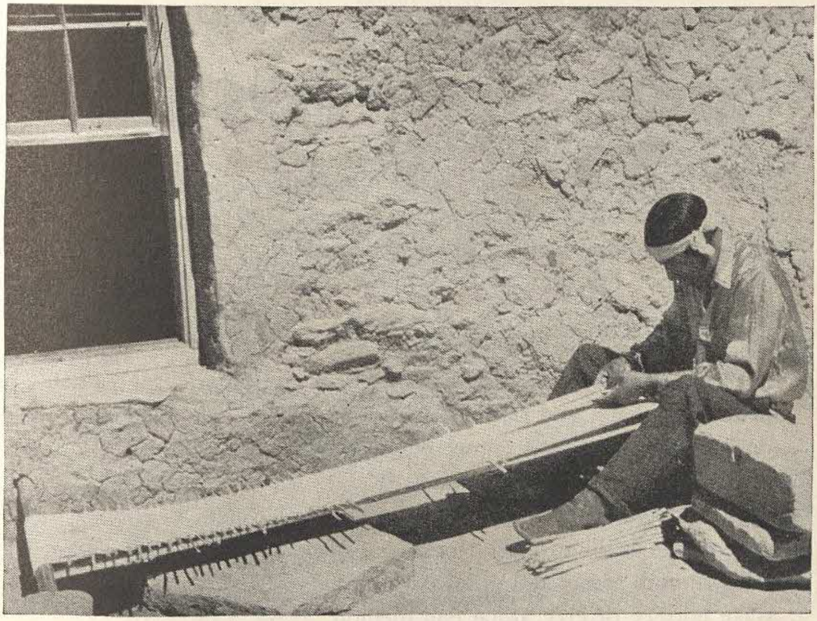

FIG. 5. A modern Indian at his work. (*Coronet Instructional Films.*)

At the Mounds call attention to the burial position of the bodies, and the relics—spears, beads, tools, pots, pipes, arrows, and so on, that were buried with the bodies.

Lesson V: Follow-up of the trip. Informal discussion.

Lesson VI: Correlation with language. Oral reports and compositions.

Lesson VII: Correlation with drawing: Draw rugs, bowls, clothing, and tents, characteristically decorated. Show "Indian Life," Unit *B* (The Classroom Teacher, Inc., Chicago) and stereographs I*B*11, 1*B*1, 1*B*11, 124, and 27-1 (Keystone View Company). Emphasize the importance and relationship of Indian art to our present-day art.

Lessons VIII-IX: Homes of American Indians.

1. Have pupils tell about Indian homes or pictures they have seen.

2. Read Dearborn's "How the Indians Lived," and Lacey's "Living Long Ago and Now."
3. Examine pictures in books available.
4. Show set "Ten Indian Pictures" (Keystone View Company).
5. Use stereographs 246, 182, 263, 290, and 205.
6. Show still film, Indian Unit *1B1* (The Classroom Teacher, Inc., Chicago).
7. Construct models of the tepee, long house, and adobe house.

Lesson X: Review. Show film "Life of the Plains Indians" (Society for Visual Education, Inc., Chicago).

Lesson XI: Use Longfellow's "Hiawatha" as literature study.

The period reflected in "The Child of Hiawatha" will have been covered in the previous work.

Show "Hiawatha," a one-reel silent film (International Education Pictures, Inc., Boston).

Lessons XII-XV: Complete drawings, sketches, stories, poems, and so on, and combine these with pictures and clippings into books for the pupils to keep.

ADDITIONAL ACTIVITIES

1. Make picture dictionaries of Indian words and phrases. This helps in spelling, language, and reading.
2. Make a wigwam in one corner of the room.
3. Make beads of clay and paper.
4. Make burlap rugs with designs painted on in lacquer.
5. Weave rugs on loom. Silk stockings can be dyed, cut, and used.
6. Bring smooth stones and grind corn meal.
7. Make pottery of clay, using coil method.
8. Make Indian dolls or dress other dolls.
9. Illustrate stories and poems.
10. Make posters of cut paper.
11. Make papoose cradle.
12. Make papoose blanket of flannelette; design with crayons.
13. Make Indian drums of oatmeal boxes and draw designs on them.
14. Make lantern slides using etched glass and colored crayons.
15. Pop some corn for the group.
16. Make feather hats.
17. Make costumes of gunny sacks.
18. Make scrapbooks of pictures, sketches, clippings, and so on.
19. Plan a picnic at the park playing Indian games, wearing Indian costumes, serving Indian food, and so on.

20. Make Indian dresses from dry-cleaners' brown-paper bags and decorate with Indian designs.
21. Make a picture of what you would like to do most if you were an Indian.
22. Assume you are an Indian child, and select one of the names below, or originate another name for yourself. Tell why you like this name.

Early Day
White Cloud
Morning Flower
Red Feather
Big Eagle
Running Wolf
Morning Star
White Eagle
Black Hawk
Blue Sky
Four Winds
Black Beaver

LEAVES

Objectives:

1. To appreciate and to understand the work of a leaf.
2. To note that leaves usually take one of six forms:

Lance
Linear
Lobed
Palmate
Cordate
Cleft

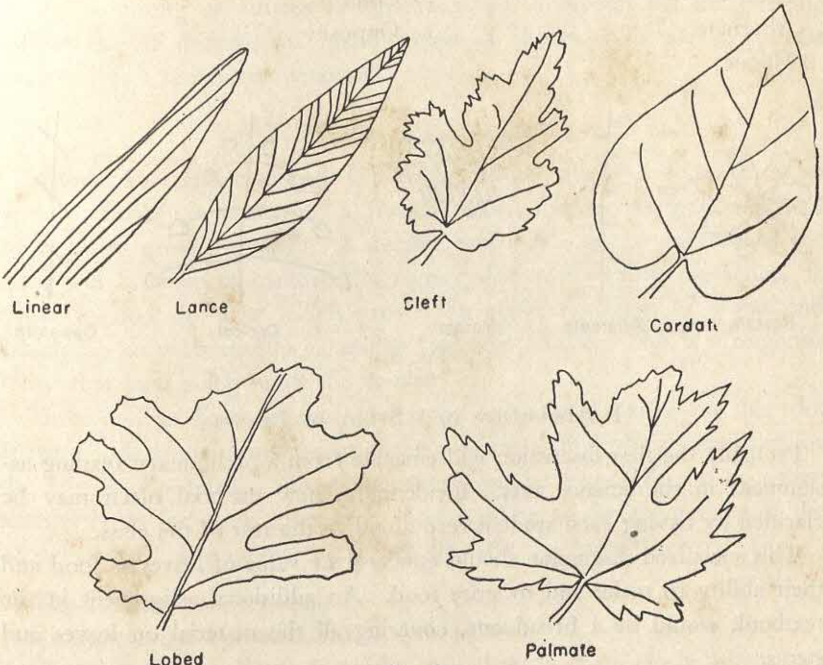

FIG. 6.

3. To realize that stems are of different kinds in order that leaves may adjust to the most direct sunlight:

Erect	Clinging
Twining	Creeping

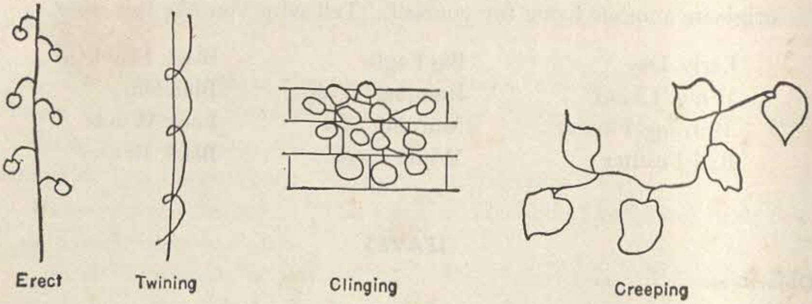
Erect Twining Clinging Creeping

Fig. 7.

4. To recognize the different arrangements of leaves on a stem, and to understand how these arrangements enable leaves to receive all the sunlight they need:

Rosette	Conical
Alternate	Opposite
Mosaic	

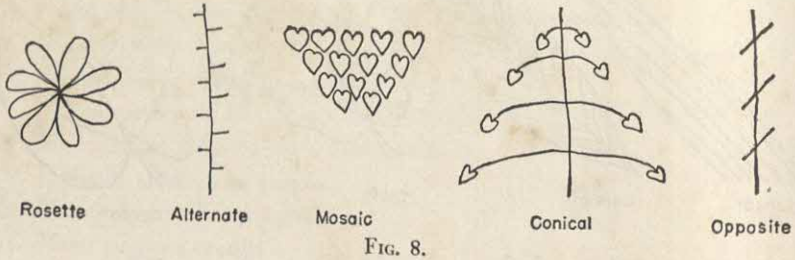
Rosette Alternate Mosaic Conical Opposite

Fig. 8.

Introduction to a Study of Leaves

Probably the first discussion will emanate from a preliminary reading assignment in the science text. Incidentally, new material often may be clarified by having each student read aloud to the rest of the class.

This socialized discussion should concern the value of leaves as food and their ability to make and to store food. An additional assignment in the textbook would be a broad one, covering all the material on leaves and stems.

3¼″ x 4″ Silhouette Slides

A good outline of the leaf may be made by placing the leaf between two pieces of clear 3¼″ x 4″ glass. It is, therefore, very simple and inexpensive for a teacher to prepare a set of 12 slides that illustrate the six forms of leaves (two different leaves for each form). The most common and easily recognized tree leaves should be used for this purpose—willow, oak, maple, catalpa, elm, and so on.

It is not necessary to have a totally darkened room to project these slides, and thus it is possible during projection to refer to these outlines drawn on the front blackboard.

As a slide is viewed, the silhouette is compared to the outline on the board. When the class has identified the silhouette as a particular form, each student may list that leaf and its distinguishing features in his notes. These large drawings on the board may be kept there for future reference.

For the next day or two the pupils will bring leaves that have been collected on the way to and from school. In class, by referring to the blackboard and by reprojecting the slides, these leaves are properly classified and mounted in individual notebooks. As the pupils enlarge their collections, additional information about the leaves may be printed next to the mounting or written as separate notes to explain the items in the collection. If desired, the identification of the trees or plants may be accepted as a secondary purpose.

Preparation for a Field Trip

In order to examine stems it is necessary to go from the classroom to an area, preferably a woods or a forest preserve, where various trees and other plants grow profusely. A teacher, well aware of the purposes of the unit, will be wise to explore the countryside surrounding the school in order to find the area which grows the greatest variety of plants and which is also most readily accessible from the school. This is a responsibility that rests solely with the teacher.

Three or four hours, exclusive of traveling time, is needed for this trip. If the woods are within walking distance of the school, the preparation for the trip is simplified. Should transportation be required, the necessary arrangements for a bus must be made according to the regulations of the school board. The following trip details must also be arranged:

1. The sanction of the principal
2. If necessary, the permission from the parents
3. Permission from private or public authorities to roam around their land

4. Plans for transportation
5. If necessary, plans for financing the trip

The students themselves should have some responsibility in making these arrangements. If the class is organized into a formal group with officers, the president, secretary, and treasurer or a special committee will handle most of these details.

Before the trip is taken, teacher and pupils together study the purposes, preparation, and procedures for the trip:

Purposes:

1. To find and study different kinds of stems.
2. To find and study different arrangements of leaves on a stem.

Preparation:

1. Upon the board are drawn large diagrams of kinds of stem and arrangements of leaves.
2. Each student copies these diagrams into his notebook in order that he may refer to them while he is in the woods.
3. Observation is made more meaningful by participation; therefore, active participation in planning, conducting, and evaluating the trip upon the part of each member of the class should be encouraged.

Procedure:

1. Organize the class into small groups, each with a leader responsible to the teacher. The members of each group understand they will work together to find specimens that illustrate the various diagrams.
2. If a streak of vandalism is possible upon the part of some members of the class, it will be wise to reemphasize respect for the property of others and the responsibility of citizens to their country and its conservation.
3. Specific instructions are given the day before the field trip is taken:

   Two pencils and a notebook are required. Comfortable, old clothes will be best. A snack can be brought along—a piece of fruit, a candy bar, or a few cookies. It is necessary to be on time and to be ready to leave at the specified time and place. When the destination has been reached, each group should sit down at the foot of a tree and plan the work they hope to accomplish. After the leader has reported to the teacher and been assigned a general direction or area in which to roam, the group may begin its work. The leader must have a watch because he brings his group back to the central meeting place at the designated time. When each group returns to the central meeting place, findings will be discussed and compared.

EXPLORING A WOODS

The trip is then taken as outlined above. If the preparation has been complete, very few difficulties will arise. During the time that the groups are browsing in the forest the teacher remains at the central spot to answer questions, to guide or further direct a group and its study, or to handle any emergency that may arise. Coats, sweaters, and snacks are piled here too, thereby freeing the pupils of encumbrances or worries over possessions and allowing them to center all their attention on stems and leaves.

When the groups return, the pupils may rest comfortably under the trees while notes are compared and the results of the field trip are discussed. This is a fine opportunity for informal discussion, and the snacks may be eaten at this time too.

Before the return journey is begun (allowing sufficient time to return to school at the hour of regular dismissal), the entire class accompanies the teacher to several particular spots that especially illustrate the objectives of the trip or that present some unusual natural phenomena.

On this walk through the woods the pupils under the guidance of the instructor note the shapes of trees and the manner in which leaves are turned to, or away from, the sun. The teacher may also desire to bring attention to leaves that protect themselves from too intense sunlight by means of hairy coverings, waxy surfaces, curling edges, and by turning the broad surface of the leaf away from the sun.

CORRELATING THE TRIP WITH OTHER CLASS ACTIVITIES

The following day the collections of leaves are brought into the classroom, and work is continued on the notebooks. An oral summary is made of the results of the field trip, and the class suggests plants that illustrate the diagrams that are still on the board.

The teacher may wish the pupils to evaluate their day in the woods. This can be done orally, in outline form on the board, or in written compositions. A brief objective test can also be given to the class.

If an individual pupil wants to enlarge his notebook, he is encouraged and stimulated to do so. Additional descriptive material or artwork can easily be written or drawn and appropriately inserted.

Some of the pupils will no doubt have found things in the woods, other than trees and leaves, that are strange and odd. These may well represent the beginning of a natural-science display or classroom museum to which later additions are made by this class or even other pupils in the school.

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[17] See footnote reference, p. 362.

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USING AUDIO-VISUAL AIDS IN THE SMALL ELEMENTARY SCHOOL[1]

Regardless of the type of elementary system in which a teacher is working, a properly planned and administered audio-visual program can strengthen and enrich the curriculum. Many teachers are aware of the extensive opportunities in this field and are making use of them daily in their classrooms. It is the purpose of this chapter to present a correlated program of audio-visual aids, which can be used in any one of the various elementary systems in our schools and which may be helpful to the busy teacher. Sometimes teachers think of films and filmstrips as the sole audio-visual aids to be used in a classroom and fail to consider the many possibilities already available in the form of newspapers, magazines, radio programs, recordings, cartoons, field trips, plays and pageants, maps and globes, sand-table projects, bulletin board arrangements, books, and so on, many of which they may already be using most effectively. The real success of the various aids is largely determined by their application and use in the daily program.

Throughout many states a program of school district reorganization is gradually changing the status of the one-room rural school. Various methods of reorganization are being carried out, and in each there should be ample provision for a program of audio-visual aids. Thus, when thinking of such a program, the teacher or director must bear in mind the fact that the work outlined here could be applicable either to a one-grade set-up or to a rural school attendance unit made up of few or several grades. Since a rural community is commonly thought of as one with a population of 2,500 or less, it is evident that many of our elementary schools which have heretofore been called city schools are really rural, and a program suitable for one could very easily be adapted to the needs of the other.

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[1] By Dorothy I. Dixon, Assistant County Superintendent in Charge of Supervision, McDonough County, Macomb, Ill.

In thinking through this type of program, many times we instinctively sense the possibilities for a well-integrated program where several grades are involved. However, we should remember that any such program should be begun by first introducing it to a room or group as a whole, then working with smaller groups, and eventually with the individual child. Therefore, if there is only one grade represented in the room, the same procedure should be followed. The material should be introduced to all; later different groups should work on special phases; finally, individual members should carry out specific projects.

Regardless of the number of grades or the size of the room involved, there will almost always be at least three levels of learning ability represented. There will be one group whose interests and abilities are such that the activities and suggestions presented for the primary or lower group would be suitable, stimulating, and interesting. Then, there is another group—mentally, physically, emotionally, and socially capable of following more detailed directions—who will be very happy doing the work recommended for the intermediate group. Finally, there is a third group, whose members have initiative and creative ability of their own, who can write scripts, make analyses, prepare more advanced reports, and so on, and who instinctively belong in the upper group. If a teacher is in a rural school, the work for the audio-visual program is automatically planned for lower, intermediate, and upper groups. Thus, whether the situation is city or rural elementary, the school can be handled as three groups, with pupils working on each of the levels.

Therefore, keeping in mind the appropriateness of seasonal material and the opportunities afforded for introduction of unit work through such materials, we make the following suggestions for a spring program, correlating all subject matter areas and utilizing available audio-visual aids. Various adaptations are possible and advisable.

In rural areas, in elementary systems in urban areas where much depends upon the nearby farming interests, as well as in larger cities where children are farther removed from immediate farming interests, there is excellent opportunity for creating a desire to learn more about farm life. Such a study could be introduced to all, or any part of, a unit system such as has been previously described. The plan used here provides for a film to be presented to the entire group first; then later individual films and other aids are used in each group (primary, intermediate, and upper). After the presentation of this film a general discussion could follow which would result in breaking up into groups for individual and group activities. When ready for the culminating activities, the entire group could again be brought together, possibly to include a rescreening of the film. In cases where two or three grades operate as one unit, the initial film should still be presented and then be followed by individual films particularly adapted to their level and abilities.

INTRODUCTION OF UNIT

Throughout the winter the children will undoubtedly have been noticing and studying various characteristics of the season. As spring approaches, great interest can be created in the changes that take place in plant and animal life during this season. Trees are budding, flowers pushing up, and the birds returning. These events suggest many possible activities, including records of the return of the birds and a study of their individual characteristics, lists of flowers (wild and tame) as they are observed in bloom, and also a study of the local trees, their leaves, and their benefit to humanity. At this time, the film "Spring on the Farm" [2] could be presented to the entire group. The following purposes are suggestive of those which should be established before the presentation of the film. It should

1. Denote changes that occur in plant and animal life during the spring months
2. Portray some of the farm activities carried out in the spring
3. Introduce the idea that life reproduces life
4. Introduce the idea of the life cycle and of spring as the time for birth and regeneration
5. Develop an appreciation of farm life and the many activities carried on there
6. Create an understanding of the interdependence of individual members of a farm family—each responsible for his own work—which is very important to the whole picture and the success of farm living

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[2] Encyclopaedia Britannica Films Inc., Wilmette, Ill.

INTRODUCTION OF FILM

For several weeks children and teacher could have been observing a particular region or spot in the vicinity of the school. The changes that have occurred during that period could have been recorded on charts, discussed informally, served as basis for oral language reports, and so on.

FIG. 1. There's fun on the farm, too. (*Encyclopaedia Britannica Films Inc.*)

Then the teacher could present the film "Spring on the Farm," calling attention to the fact that, although the film may have been photographed in a different geographical area, there will be many similarities which they should note. The variations, too, will prove interesting.

PRESENTATION OF FILM

Joan and Jerry Johnson observe changes that take place in plant and animal life during the months of March, April, and May.

FOLLOW-UP

During this period of discussion immediately following the presentation of the film, activities related to the various areas should be stimulated and encouraged. The following suggest some of the possibilities in these areas:

I. Science

- *A.* Keep charts and individual lists picturing or listing
    1. The first signs of spring observed
    2. The trees that bud first
    3. Flowers that break through first
    4. Flowers that bloom first
    5. Earliest birds to appear in local community
- *B.* Keep an up-to-date, challenging science corner or table to which children bring specimens to be properly studied, identified, and labeled (frogs, tadpoles, moths, cocoons, chrysalises). (Observe the stages in the life cycle of a tadpole or a moth, if possible.)
- *C.* Keep a weather record.
- *D.* Keep a shadow record.
- *E.* Collect pictures of birds representative of the local area.
- *F.* Keep an up-to-date science word list.
- *G.* Have a small or portable bulletin board for challenging, thought-provoking questions.
- *H.* Survey the community to see what, if any, wild-life sanctuaries are to be found within its boundaries.

II. Social studies

- *A.* Discuss ways in which people change their work, play, clothing, housing, and food to adapt themselves to change from winter to spring weather.
- *B.* Take trips to farm (for city children) to enrich their social background.
- *C.* Make survey of community to discover public and personal attitudes.

III. Language arts

- *A.* Prepare and present oral discussions on various phases of farm life in the spring.
- *B.* Participate in round-table and group discussions.
- *C.* Write letters to farm friends requesting information.
- *D.* Write original plays, stories, and poems.
- *E.* Prepare written reports on particular phases of the unit to which careful study and research have been given by the individual.
- *F.* Summarize and present to the class oral reports on farm stories and books read in connection with the study.
- *G.* Read widely—in books, magazines, and newspapers.

H. Collect articles, cartoons, and jokes having to do with farm life.

I. Keep vocabulary list—Cecropia, moth, cocoon, cowslips, furrow, and so on.

J. Choose poems and stories especially applicable to the film. Make into scrapbook or arrange on special bulletin board.

IV. Mathematics

A. Observe number-relation possibilities for primary pupils:

1. How many cows did Joan and Jerry bring up to the barn?
2. How many sheep were in the Johnsons' flock?

B. Figure approximate cost to Mrs. Johnson of hatching and feeding her baby chicks.

C. Compare sizes of different fields in which Mr. Johnson works.

D. Show film "Measurement" [3] to upper grades. In order to make the best use of the film, which very aptly presents many practical uses for a knowledge of measurement, pupils should be prepared for its presentation in advance. The teacher can help them know what to look for in the picture by arousing their interest in the type of activity to be observed. A short discussion of the different opportunities or needs for measurement in their daily lives will lead the children to think of many uses that otherwise they would take for granted or overlook. Such a discussion will prepare them to see the film after which they may discuss

1. How different types of measurement are used in daily life
2. How linear measure could be used to determine the size of the Johnsons' garden or the field in which Mr. Johnson planted corn
3. The need for understanding liquid measure when milking cows, handling the milk, or filling the tractor with fuel
4. The need for the ability to measure seed to be planted in the garden and to determine the number of bushels of corn or oats needed to plant a 40-acre field
5. The importance of being able to read a thermometer
    - *a.* Body (in case of illness)
    - *b.* Oven (when baking cakes)
    - *c.* Outdoor or indoor temperature
6. Development of an appreciation of time of year (for preparing seed bed and planting crops) and of days (for play and also for understanding of proper time for help with morning and evening chores, and so on)

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[3] Encyclopaedia Britannica Films Inc., Wilmette, Ill.

V. Fine arts

A. Art

1. Make friezes or murals depicting different scenes from farm life in the spring.
2. Make freehand drawings showing different characteristics of domestic animals or birds in local area.

FIG. 2. Spring time is planting time. (*Encyclopaedia Britannica Films Inc.*)

3. Study and appreciate famous paintings and masterpieces.
4. Arrange an exhibit of books, stories, and poems that deal with farm life and spring.

B. Music

1. Sing songs suitable to different grade levels.
2. Learn original songs composed by group or individuals.
3. Make recordings.
4. Listen to radio programs.

If the film "Spring on the Farm" is first presented to the entire group and some of the above-suggested activities are carried out, it may be advisable to have the rescreening of the film at this time for the purpose of clearing up any points about which there might be some question.

Following the reshowing, a short period for general discussion could serve to clear up any questions still remaining. Then the group could be divided into primary, intermediate, and upper sections for the purpose of furthering the spring study at the level of each group.

PRIMARY GROUP

INTRODUCTION

In observing the preparations of plant and animal life for spring, children will probably have opportunity to note the squirrels in their area who are building their summer homes. Careful observation will show these homes to be near the winter ones and, usually, among the high branches of the trees. When they watch to see how their food habits in the spring are different from the ones they practice during the winter months, many observations can be made. As a result, experience charts can be developed, telling the story of the habits of the squirrels they have been observing. An example of such a story might read:

GRAY SQUIRREL

Gray squirrel has a home in our yard.
He lives in a nest.
The nest is in the big oak tree.
Gray squirrel likes to play on the ground.
He has a long tail.

Other charts, similar in nature, could be developed according to the information possessed by the pupils and depending upon their interest in the subject. Interest could be further aroused through stories they might find in readers, supplementary and story books, and picture books. An interesting arrangement of squirrel pictures on the bulletin board, or a collection of nuts brought into the classroom by the teacher, might serve to create a desire to find out more about squirrels.

If there are no squirrels in the schoolyard or nearby, perhaps the teacher and children could plan a trip to the woods (in the country) or to the park (in the city) to try to see some squirrels and also to observe the signs of spring.

If such a trip is made, the children and teacher should plan together for the experience and set up their objectives before actually taking the trip. Since the study of squirrels in the vicinity is the major purpose of the trip, the following are some of the objectives that might be considered in gathering information concerning the squirels observed:

1. Observe carefully to see where the first squirrel is located.
2. What are the squirrels doing? (Getting food? Building nests?)
3. How do they move? (Rapidly? Slowly?)
4. What are some of the special characteristics of the squirrel?
    Color
    Long, bushy tail
    Size and shape of body
    Length of body
    Use of feet in climbing
5. Where is the squirrel's home?
6. How can you tell that the squirrels need a different home this spring from the one they have occupied during the winter?
7. How would the change in seasons affect their habits of gathering food?
8. Do you see more than one kind of squirrel?
9. Does the squirrel have any enemies? How can he protect himself from them?

During and immediately following the trip there should be free discussion and exchange of observations. If many squirrels have been seen on the trip, the children will probably be very enthusiastic about the habits and characteristics they have been able to observe. As a result, some of the following activities may result from the one trip:

I. Language arts

1. Collect stories about squirrels from the library or library table and read them or have them read to the group.
2. Tell the group about some of the squirrel habits observed on the trip.
3. Prepare original stories or charts recording experiences of the trip.
4. Keep a list of new words used.
5. Make a picture dictionary of terms having to do with the study of the squirrel family.

II. Science

1. Find out about the kinds of food preferred by the squirrels.
2. Learn about the difference in their summer and winter homes.
3. Discuss the value of their natural coloring as a protection from their enemies.
4. Study the kinds of tree in which squirrels prefer to build their homes.

III. Social studies

1. Discuss the need for different kinds of home for squirrels in this locality.

2. Compare the above with the changes made by people in their living habits according to the seasonal changes.

IV. Fine arts

1. Collect pictures of squirrels for notebook or bulletin board use.
2. Make original sketches of squirrels and their homes as observed on the trip.

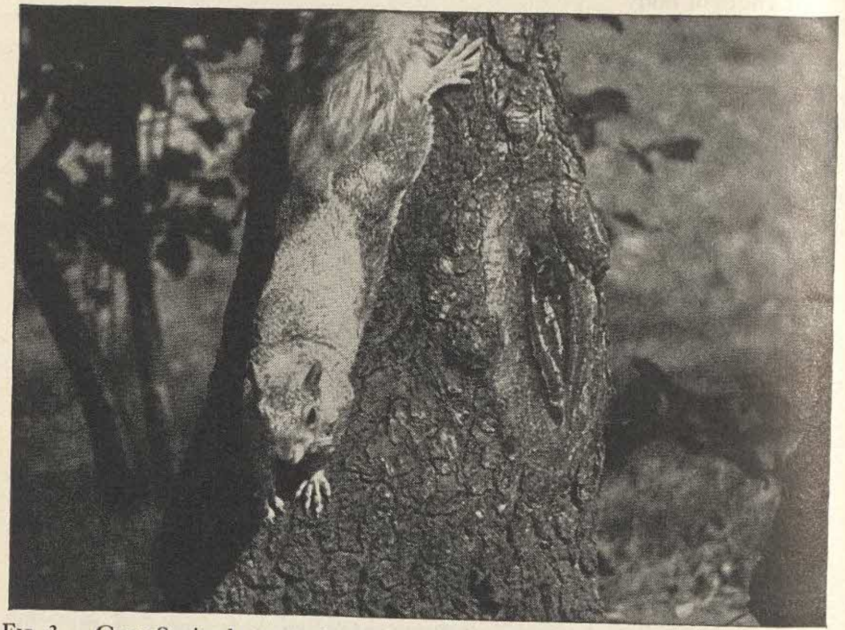

FIG. 3. Gray Squirrel comes down head first. (*Encyclopaedia Britannica Films Inc.*)

3. Make friezes or murals depicting some of the observations of the group.

With any such motivation as has been previously suggested, the teacher has a natural setting for presenting the motion picture "Gray Squirrel."[4] Because it is a film about a squirrel family, it should help to answer the children's questions as well as prove very interesting to them because of its "child appeal."

Before seeing the film, the children with the help of the teacher should have established some purposes for seeing it. Perhaps they will want to know

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[4] Encyclopaedia Britannica Films Inc., Wilmette, Ill.

1. Where do squirrels get their food?
2. How can they climb trees?
3. How and where do squirrels build their nests?
4. Where are the baby squirrels born?
5. Can baby squirrels see?
6. Who takes care of them when they are little?
7. How do squirrels crack nuts?
8. How and where do they store food for the winter?

Presentation of Film

After the above described introduction, the group should be ready to see the film "Gray Squirrel"—a sound film portraying a squirrel family in its natural environment. In presenting the film, the teacher should keep in mind the following objectives:

I. General objectives

1. To develop an appreciation of the birth and development of animals
2. To encourage the development of the powers of observation
3. To develop a realization and appreciation of the interdependence of animals
4. To encourage a humane attitude toward all animals
5. To develop an interest in animals and to encourage an appreciative attitude toward them

II. Specific objectives

1. To develop an understanding of the environment of the squirrel
2. To be able to identify the different kinds of squirrel seen in the picture
3. To learn some of the common enemies of the gray squirrel
4. To learn about the food habits of the squirrel family
5. To understand and appreciate the part of the father and mother squirrel in rearing their young
6. To recognize the physical changes that take place in squirrels from birth to maturity

To the above she may wish to add others which seem to her especially important in her own particular room and with her specific group. These are again only suggestive. The teacher must always remember that much of the success of any presentation depends upon how well she knows and understands her group and how she attempts to meet their individual needs. The group should now be ready for the film "Gray Squirrel."

FOLLOW-UP

This should be an interesting period of free, spontaneous discussion. Careful observation will enable the teacher to determine whether an immediate second showing is advisable or whether the children have clear concepts, have the answers to most of their previously established questions, and are thoroughly stimulated for further activities. If the latter is true, there are numerous possibilities for extending the interests already created and at the same time for encouraging further learning situations. Some of these could be included in the following areas:

I. Language arts

1. Dramatize portions of the film which they especially enjoyed and which tell something about the special characteristics of the squirrels.
2. Plan and prepare additional experience charts with original sketches by the children to illustrate each story.
3. Tell original stories about squirrels.
4. Enjoy stories and poems about squirrels read by the teacher or an older child (third grader possibly).
5. Keep a word list—words needed to tell or write stories about squirrels.
6. Third graders could prepare picture booklets with short stories. First and second graders could choose pictures to mount and under them write word or sentence explanations.

II. Science

1. Learn the names of the different kinds of trees in which squirrels make their homes.
2. Learn to identify the different squirrels in the vicinity or section of the country in which you live.
3. Discover the kinds of food preferred by squirrels and bring examples to the science corner.
4. Compare squirrels' ability to store food for winter with that of humans.
   - *a.* How are they alike?
   - *b.* How are they different?

III. Mathematics: Discuss the length of the squirrel (approximately 18 in.) and compare it with other known lengths.

IV. Social studies

1. Discuss the importance of the two types of home which squirrels have.

Would it be necessary to have both a summer and winter home if the squirrels lived down South? Which type would they be most likely to need there?

2. Prepare illustrated booklets showing how other animals vary their living habits with the change of seasons.
3. Study their own homes and learn what changes are necessary to prepare for the different seasons. (Excellent helps may be found in the Social Studies section of Illinois Course of Study and Curriculum Guide for Elementary Schools.)

V. *Fine arts*

1. Art
   - *a.* Collect pictures of different kinds of squirrels.
   - *b.* Prepare colored glass slides showing the different kinds of trees in which squirrels make their homes.
   - *c.* Make friezes showing different phases of the life of a squirrel, as the pupils have observed them.
   - *d.* Draw pictures of squirrels—each pupil using his own originality.
   - *e.* Use opaque projector to project on blackboard or screen some of the original drawings or pictures from post cards which teacher or pupils may bring.
2. Music
   - *a.* Compose songs about the squirrel and set them to familiar music.
   - *b.* Listen, sing, march, or do other rhythm activities in connection with the squirrels or other animals discussed in the film or the study which follows.

CONCLUSION

As most teachers know, providing many opportunities to appear and talk before a group from the first grade on up is an excellent device for overcoming any fears or blockings that might otherwise occur later in life. Thus, throughout this entire study, many such possibilities have been suggested. In concluding the unit, every child should have an opportunity to tell about something he has especially enjoyed doing in this study of the gray squirrel. This may take place in his own room with only his classmates present, or another group of children may be invited in to hear about his experiences. After this the children may request another showing of the film. However, instead of repeating this film it might be desirable to present similar material, but in a slightly different form, at this time.

Thus, in addition to, or in place of, some of the activities described above which could be an outgrowth of the unit's work, it might be very practical to present the filmstrip "Gray Squirrel."[5] The filmstrip is introduced with a series of questions and concluded with some review questions. Nevertheless, before seeing it, the children and teacher need to plan together concerning their purpose in studying the filmstrip. Perhaps they will want it to show:

1. How baby squirrels learn to climb
2. How they get their food
3. How they store food for winter
4. Where they build their nests
5. How they climb trees
6. How and where they sleep

During the development of the above and/or other similar questions, several of the children may be able to answer some of them from their own experiences and observations, even before they see the filmstrip.

Then the filmstrip can be presented. Since it is possible to do so, it would probably be desirable to stop the projection and briefly discuss the questions at the beginning of it. Those questions are

1. Where do they live?
2. What do they look like?
3. What do they eat?
4. How do they play?
5. How do they build their summer homes?

Most of the answers will be evident during the showing of the rest of the filmstrip. In addition to answering the questions already established, the teacher and pupils could use the review questions at the end of the film as a guide for summarizing their discussion. Some of the activities that might grow out of this work could include:

I. Language arts

1. Writing original stories about squirrels
2. Reading many stories about squirrels
3. Making experience charts telling about other animals in the neighborhood
4. Telling the class stories about squirrels (or other animals) that they have observed
5. Keeping a word list on blackboard or bulletin board

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[5] Encyclopaedia Britannica Films Inc., Wilmette, Ill.

II. Science

1. Learning more about the kinds of food preferred by squirrels
2. Preparing a feeding station for squirrels close to the tree in which they have their home
3. Discussing the change of seasons and how that affects the supply of food available for animal friends
4. Taking a trip in the nearby area to watch for squirrels and other animals

III. Social studies: Discussing the different types of home needed by all animal friends.

IV. Mathematics

1. Estimating how high squirrels climb and how far they jump from limb to limb of the tree
2. Estimating and possibly reading to find out how long baby squirrels are and "how much of that length is tail"
3. Working simple problems concerning the number of squirrels, the trees, acorns, and so on

V. Art

1. Collecting pictures of squirrels or other animals for a scrapbook
2. Drawing original pictures
3. Making original invitations to program to which parents or other classes may be invited

INTERMEDIATE GROUP

During the study of spring, which grew out of the presentation and discussion of the film "Spring on the Farm," it was suggested that the pupils keep charts and lists recording (in pictures or words) various changes in their community at this season of the year. This was a part of the science program. In making these records not only do the children observe the first signs of spring, the first buds on the trees, the first flowers to break through and the first ones to bloom, but they are usually very much interested in watching for the first birds to return from their winter homes. In the above-mentioned film, they heard and saw that the robin was the first bird pictured that had just returned from the South where he had spent the winter. If charts and lists have already been started in the classroom perhaps some observing pupil has discovered a robin near the school or near his home and has recorded the date and place of his observation.

It is possible that other birds may also already have returned for the summer.

In order to promote and encourage the further study of local birds the teacher tells the children that she has a film called "Birds of the Dooryard" [6] which should be very interesting and helpful to them.

FIG. 4. "Well, I'm back and working on my nest." (*Coronet Instructional Films.*)

Before seeing the picture, the group should have certain objectives established. To be helpful to them the film should

1. Show various birds familiar in this area
2. Present characteristics of each in coloring, habits, types of nest, number and color of eggs, and so on
3. Depict ways in which birds are helpful to the community in which they are found
4. Present some of the enemies of birds in the community and show how nature helps them to be protected from these enemies
5. Show the cooperation between mother and father bird in sitting on the eggs, feeding the young, and teaching the baby birds how to fly. (Com-

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[6] Coronet Instructional Films, Chicago.

pare to the responsibilities accepted by pupils and parents for their own well-being.)

6. Develop an appreciation for the pleasure provided by the birds who nest in our shade trees, shrubbery, and the houses we provide for them

INTRODUCTION OF FILM

As has been mentioned, the children have already been watching for early arrivals of birds while carrying out previous activities in connection with their study of spring. With their natural curiosity and interest thus aroused the teacher can introduce the new phase of the study by leading a discussion on the birds they have seen that wintered here and those that went South during the coldest months. If some of the latter have already returned, the robin will undoubtedly be among them since he is usually one of our earliest harbingers of spring. By again mentioning to pupils that she has a film showing some of these birds, the teacher has set the stage for the presentation of the film "Birds of the Dooryard."

PRESENTATION OF FILM

The birds whose characteristics and habits are depicted in this color film are the robin, sparrow, bronzed grackle, house wren, yellow warbler, and purple martin.

FOLLOW-UP

After a brief discussion it would probably be very desirable to show the film again in order that more minute details concerning the habits and coloring of the birds might be observed and clarified. Although many of the questions previously established may have been answered by the initial showing, important details are often overlooked in an effort to absorb as much from the picture as possible.

As an outgrowth of an extensive discussion of the film, individual children may indicate a particular interest in one bird and a desire to make a more thorough study of it. If so, they could establish their general goals or aims and then each proceed to make his own individual investigation. As a culminating activity, each member of the group could present his findings to the entire group—as well as to parents or others in the community interested in the work being done by their boys and girls. Bird lovers and specialists could also make their contribution by appearing before the group upon the invitation of some member and by explaining their interest in birds and what they have done to encourage them to remain in the local area. The following suggestions for activities in the various areas will be jointly planned, and each child will include as many as seem feasible or practical to him for his particular study:

I. Language arts

1. Read many books, stories, and poems.
2. Make a collection of the most interesting stories and poems about the bird you are studying.
3. Prepare oral reports to give before the group.
4. Write an invitation to some person who might speak to the group about birds in the local community.
5. Write letters for information concerning the best methods and materials to use in making feeding stations, birdhouses, and so on.
6. Prepare the part of the culminating program for which you will be responsible.
7. Keep a list of the new words with which you have become acquainted. Be prepared to explain their meaning and use.

II. Science

1. Learn about the nesting habits of your bird.
2. Be ready to explain how it gets its food and what it prefers.
3. Find out how its coloring may often serve to protect it from its enemies.
4. Study natural protection, bird sanctuaries, and so on, and be ready to speak in favor of (or against) the conservation of birds in your local area.
5. Study the body formation, shape and size of head, bill, and so on, of the bird.

III. Social studies

1. Prepare a map showing the approximate territory over which the birds travel in going from their summer to winter homes and back again.
2. Collect pictures and stories about the regions over which they pass in their travels.
3. Prepare glass slides showing the states over which they fly.
4. Prepare glass slides showing the rivers and mountains (if any) which would be along their route.
5. Choose pictures or picture post cards to show with opaque projector.
6. Plan an imaginary airplane trip to accompany the birds South this winter. Using the maps, slides, charts, and globes, describe your trip.
7. Prepare a 15-minute radio program to be presented over local station.

RADIO PROGRAM

Preparing a program to present from the local radio station requires much careful planning by the teacher and pupils. Such an activity often provides excellent stimulation for a much more detailed study of the topic to be presented than pupils would otherwise be interested in making.

It will be necessary, first of all, to decide on the type of program to be given. This will lead to a discussion of some of their favorite radio programs and should enable pupils to list some criteria which they feel contribute to their listening pleasure and information. Some of the favorite broadcasts may be those in which the information is presented by a discussion group, by several individuals who report briefly but intelligently upon their particular phase of the topic under discussion, by an original play written by the group for this particular purpose, through the medium of a quiz program, and so on. It will be necessary to discuss each method carefully and to keep in mind the special information which the group desires to make available to the listening audience. Perhaps it will be desirable to plan two different types of program and leave the final decision as to which will be used until later. This might prove especially challenging to those preparing the different programs and bring forth some very original, interesting plans.

In all the work connected with the broadcast—the preparation, presentation, and follow-up—there will be many opportunities for activities in the different subject matter areas. Some of them might be

A. Language arts

1. Letters written to studio to make arrangements for the program
2. Personal conversations (if possible) with studio staff members prior to the date of the broadcast
3. Preparation of the script
4. Reading of many stories, poems, articles as a background of information
5. Oral voice training in preparation for actually speaking over the radio

B. Mathematics

1. Responsibility for proper distance from microphone during broadcast
2. Some information concerning size of "listening area" of the local station

3. If possible, information concerning the usual charge for a 15-minute commercial broadcast
4. Correct timing for entire program

C. Fine arts

1. Choice of appropriate songs, if music is used
2. Selection and practice of background music, if desired for use on the program
3. Study and interpretation of different qualities of voices and an understanding of the most desirable ones for broadcasting group

The above activities are only suggestive and should be enlarged upon by any teacher, who with her group prepares such a broadcast. Through these, or similar experiences, every teacher will want her pupils

1. To gain a greater appreciation for the radio programs to which they listen each day
2. To be better informed concerning the amount and type of work required to present thorough, accurate information via the radio
3. To have a more discriminating attitude concerning the programs they hear, as a result of selecting and choosing the material for their own program

IV. Mathematics

1. Estimate the number of miles covered by different birds in their yearly journeys.
2. Determine the approximate saving to the farmer each year due to the number of insects destroyed by some member of the bird family.
3. Prepare, on glass slides, graphs showing the benefit to crops and gardens resulting from the protection of the birds in the area.

V. Fine arts

A. Art

1. Select charts, pictures, maps, and so on, connected with your study for attractive arrangement in the schoolroom.
2. Prepare a bulletin board arrangement showing
    Favorite poems
    Favorite pictures
    Selections from favorite stories
    A combination of the above

Certain principles for arrangement of materials on the bulletin board should be discussed and worked out by teacher and pupils previous to preparation of the bulletin board. The list might include some of the following suggestions:

- *a.* Material should be carefully selected and definitely related to topic being considered.
- *b.* Arrangement of materials should be interesting and challenging.
- *c.* Balance of items is important, but arrangement should not be monotonous.
- *d.* Sometimes titles are desirable for illustrations, and at other times short reports or discussions may be placed on bulletin boards with the illustrations.

If bulletin board is arranged by pupils, it should be presented or referred to as a part of the discussion period. Material should be changed frequently and bulletin board kept challenging and interesting to all.

3. Prepare an original illustrated booklet showing the habits and characteristics of the one particular bird you have selected.
4. Study bird nests and show by original charts or pictures the type of nest, its location, the number of eggs in it, and so on.
5. Study and observe the difference in coloring often apparent in the male and female of the species.
6. Prepare a frieze showing nesting habits of the birds (this may be a joint project showing all the birds studied).

B. Music

1. Songs about chosen bird to be taught to, and enjoyed by, the entire group.
2. Recordings of bird songs.

At this time, and while working with this particular unit, it would be very desirable to introduce recordings of songs of some of the birds of the local area, which have also been seen in the film "Birds of the Dooryard."

In preparation for the use of the recordings, the teacher should guide the discussion to include observance of local bird songs. Pupils should be encouraged to listen to and enjoy, whenever possible, these songs. This may be possible while at school, if there are birds in the immediate area, or while the pupils are en route to school or engaged in other activities in connection with their home life. Some pupils may be very able to imitate certain of these songs.

With the above for a background of information, the teacher can invite the pupils to listen to some recordings that have been made of bird songs. Before listening to the record the first time, certain questions should be established, such as:

1. What bird songs are recorded?
2. How many have you heard before?
3. Do they sound familiar?

These three questions would probably be sufficient for the children to consider the first time the recording was played. If the children listen for too many things at once, they are apt to lose both the information and appreciation being sought. One of the recordings that might be used is "Birds of Northern Gardens and Shade Trees,"[7] which includes (on one side) the songs of the song sparrow, robin, catbird, Baltimore oriole, yellow warbler, and flicker.

It may be desirable to hear the recordings two or three times, with brief discussions between, before question 3 above can be adequately answered. This could then be followed by a general discussion of the characteristics of these songs and could very logically be concluded by the making of some original recordings, either of imitations by the students or of actual bird songs in the area. It might also be desirable to take the pupils on a field trip for the purpose of listening to, and identifying, as many of the bird songs that were studied as it is possible to hear on one trip.

Many of the activities suggested are suitable for individual or group projects. Preferably both methods should be used, depending largely upon the needs and interests of the pupils.

A culminating program at which time each child would present his most important and interesting information to the rest of the group could later result in a similar presentation at a PTA or community meeting. At this time the film "Birds of the Dooryard" could be shown and later discussed. Much community interest in the protection and conservation of bird life might thus be stimulated and encouraged.

UPPER GROUP

After the presentation and development of the film "Spring on the Farm," there could be placed on the blackboard or bulletin board, or projected on the screen by use of the opaque projector, the first stanza of

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[7] Cornell University Recordings, Albert R. Brant Bird Foundation, Laboratory of Ornithology, Ithaca, N.Y.

America the Beautiful

"O beautiful for spacious skies,
For amber waves of grain,
For purple mountain majesties
Above the fruited plain!
America! America!
God shed His grace on thee,
And crown thy good with brotherhood
From sea to shining sea!"
—Katharine Lee Bates

From a discussion of the real meaning of the words "America the Beautiful" and the many material factors which contribute to the success and happiness of everyone, the teacher could then guide the group to a greater appreciation of these blessings. The discussion could be supplemented with poems and pictures about other blessings in addition to the spacious skies, the beautiful grain fields, majestic mountains, and fruited plains. To the question "What other important contributions does our country make

Fig. 5. Yellowstone Falls—a part of America the Beautiful. (*Erpi Picture Consultants, Inc.*)

to our happiness and comfort?" could come answers which would include a realization of the many resources of this "America the Beautiful."

The next and most logical questions to consider are "What are we doing to these resources?" "Are we using them wisely?" "Are we conserving them wherever possible?" These and other thought-provoking questions would create an interest in, and a desire to learn more about, our material resources and how they may be best and most wisely used. Newspaper headlines similar to the following should arouse an interest in learning what to do to prevent such destructive floods in other parts of the country:

COLUMBIA RIVER GOES ON RAMPAGE

CITIES AND TOWNS THREATENED BY INUNDATION

VAN PORT RESIDENTS BEING EVACUATED TO HIGHER GROUND

LOSS OF LIFE MAY BE UNDETERMINED FOR DAYS

THOUSANDS OF ACRES OF FARM LAND INUNDATED BY FLOOD WATERS

Current events—from recent magazines and newspapers—would substantiate the idea already forming that "our natural resources must be conserved more wisely if we are to prevent similar disasters in other areas and save for future generations some of the resource wealth of our nation."

A field tour of the local community to discover evidences of lack of conservation practices can create a definite desire to learn more about how to prevent soil erosion by wind or water, how to stop floods, prevent forest fires, and so on. Cities, too, have many problems that concern the failure to adopt proper conservation practices. A trip to a nearby strip mining area would be excellent stimulation for a discussion of conservation of another of our natural resources.

By this time all members of the group should be interested in the topic. In order further to prepare them for a unit of work in this field, a brief résumé of the pioneer conservation activities of Gifford Pinchot or Theodore Roosevelt could be presented by the teacher (or a pupil to whom the assignment had previously been made). Any one of these introductions should help to strengthen and promote the following objectives considered by the teacher in presenting the unit of work:

1. It should create an interest on the part of every pupil in the subject of conservation.
2. It should so stimulate and challenge him that he will want to assist in promoting worthwhile conservation practices.
3. It should broaden his concept of the conservation program by helping him to realize that it is a continuous program—the need for which could

be traced almost to the time of the pioneer—and that it will continue to play an important part in the progress of our civilization.

4. It should help him to see what has already been done and to realize the immensity of the problem ahead in preventing unnecessary waste of any or all natural resources.
5. It should create in him a desire to learn the best way to use the resources available, as well as the knowledge of how to prevent their useless waste.

Before continuing the subject further, the teacher should explain that she has a film which deals with several phases of conservation and ask if the pupils would be interested in seeing "Conservation of Natural Resources." [8] Since, by now, the interest and enthusiasm of the entire group should be thoroughly aroused, it would be wise to establish the aims or objectives for the use of the film before it is presented. Through the cooperative thinking of both teacher and pupils, aims similar to the following could be established:

1. To discover the vast important natural resources of our United States
2. To learn how our resources have been used and wasted in the past
3. To see how seriously the supply has been depleted
4. To try to gain a clearer concept of the wise use of these resources, as explained by Gifford Pinchot who said, "Conservation is the greatest good for the greatest number for the longest time"
5. To gain a better understanding of our dependence upon these gifts of nature—not only for our protection and enjoyment but in order that future generations may also enjoy some of the benefits to be had from a wise use of them

Presentation of Film

"Conservation of Natural Resources" is a film depicting the story of the conservation of the resources which many of us have taken for granted exist in unlimited amounts in these United States. It presents very graphically the story of the dwindling supply of these resources.

Follow-up

Immediately following this initial showing, a general discussion should be held. If questions arise that can best be explained by reshowing the film at once, such a procedure is recommended.

After this, individuals or small groups of pupils will find much interest in, and benefit from, carrying out as many as possible of the following suggested activities:

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[8] Encyclopaedia Britannica Films Inc., Wilmette, Ill.

Science: Make an intensive study of one phase of conservation under the guidance and direction of the teacher. For example, the following unit on Soil Conservation was developed and used very successfully by Mary Louise Hinman. It is included here with Miss Hinman's permission, just as it was carried out in the school in which she worked,[9] as a suggestive guide for similar studies elsewhere.

SOIL CONSERVATION

I. Approach

- *A*. Described vividly our community during earlier days before the white settlers came—the trees, flowers, wild birds, prairie chickens—and then contrasted with today—cultivated fields damaged by erosion, few places for wild life. For exact details, see "Would You Like to Have Lived When?" National Wildlife Federation, Washington, D.C.
- *B*. Developed an interest in the need for saving our soil or conservation.

II. Planning period. Developed with the children some guides for study as

1. How can we prevent erosion?
2. How are terraces built?
3. Why doesn't Illinois have as much wind erosion as water erosion? (Many questions arose, as the study continued.)

III. Procedure. Developed these concepts and understandings with the children through discussions and illustrations and reading.

1. Raindrops come from the ocean and return to it. (The following story was used.)

SALLY RAINDROP

Sally Raindrop lived in the ocean with other raindrops. One day the *sun* asked Sally to come up and play with him.

She and her friends started (*evaporation*). As they got part way up, the wind came along and blew them. They went together into a mass, called a *cloud*. The wind blew the cloud over a hillside.

Sally got chilly and wanted to go back to get her raincoat and fell to the earth as *rain* on a hill where corn was planted in rows up and down the hill. She raced down the hill making a *gulley* and soon reached the river and went back to the ocean without being *absorbed* into the soil.

2. Erosion can be prevented by contour farming, strip farming, terraces, planting trees, grass crops, crop rotation. (Illustrations and stories were used again.)

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[9] The rural schools of Coles and McDonough Counties, Ill.

3. Erosion can be stopped by brush dams, concrete dams, and wire fencing.
4. Soil is made of elements–sand, silt, clay, humus, making loams, and so on.
5. Soil is lost through erosion, leaching, and removal of crops.
6. Soil can be built up by adding commercial fertilizers, rotation of crops, planting of legumes, and so on.

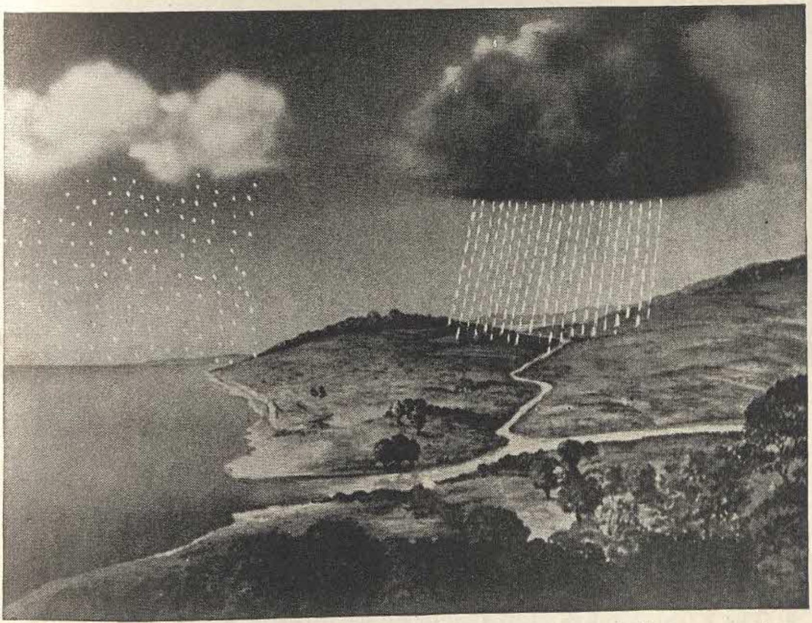

FIG. 6. Sally Raindrop and her friends first went up and then came down. (*Encyclopaedia Britannica Films Inc.*)

7. Precipitation occurs in various forms–rain, sleet, snow.
8. Conservation is saving and using wisely.
9. The balance of nature must be preserved. Plants help animals while animals help plants; for example, birds scatter acorns from which oak trees grow to make food and shelter for birds.
10. Our food, shelter, clothing, and many pleasures are dependent upon soil.

IV. Activities. After the concepts were developed, these activities were carried out to help make the ideas clearer:

1. Made individual notebooks.
2. Made a large movie showing the ways of preventing, stopping, and controlling erosion; and the balance of nature.

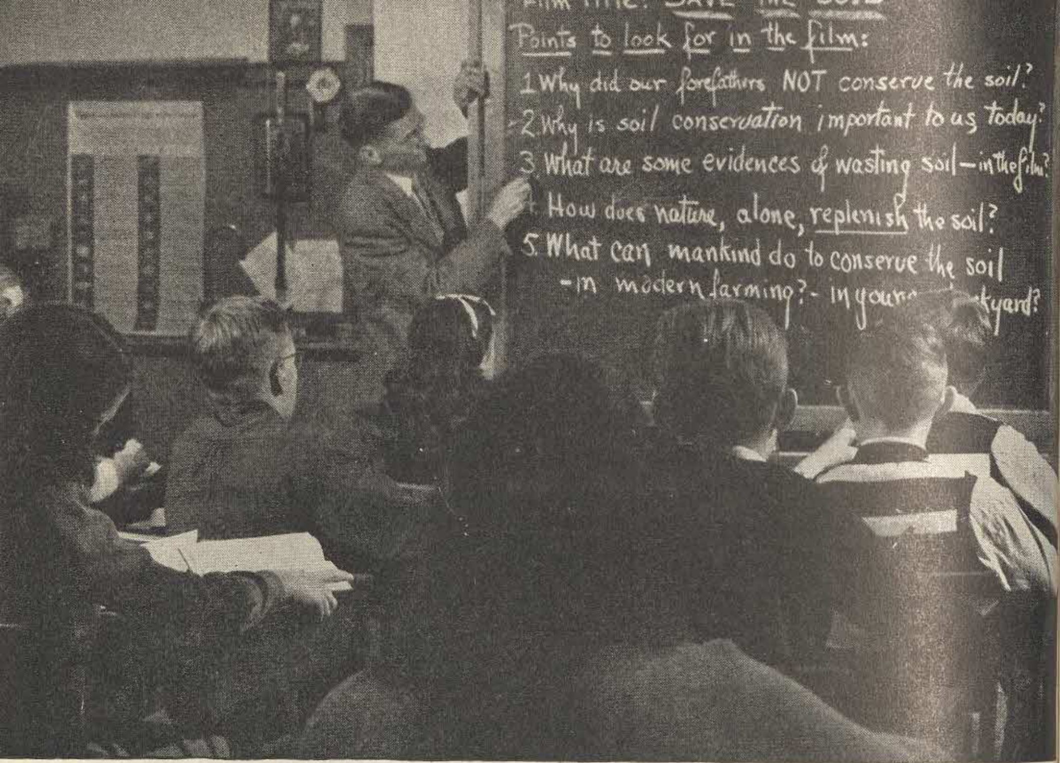
Points to look for in the film:
1 Why did our forefathers NOT conserve the soil?
2 Why is soil conservation important to us today?
3 What are some evidences of wasting soil—in the film?
4 How does nature, alone, replenish the soil?
5 What can mankind do to conserve the soil
- in modern farming? - in your kyard?

FIG. 7. Now watch for these points. (*Educational Screen.*)

3. Collected samples of soil.
4. Made soil maps of our school district.
5. Collected samples of seed of our crops.
6. Kept word lists.
7. Made study guides.
8. The Farm Adviser visited us and talked of soil erosion and showed us how to test soil.
9. Traced water in our locality from its source back to the Gulf of Mexico.

V. References

1. "Conservation Education in Rural Schools" by Effie Bathurst, Department of Rural Education, National Education Association, Washington, D.C.
2. "Conserving Our Soil Resources," State Department of Instruction, Springfield, Ill.
3. "Junior Arts and Activities," 4616 North Clark St., Chicago, 40. June, 1942, pp. 20–22.
4. "Helps in Planning Conservation Learning Experiences," State Department of Instruction, Madison, Wis.

5. Soil Report No. 7, "McDonough County Soils," University of Illinois, Urbana, Ill.
6. "Soil Conservation in Indiana No. 228," Purdue University, Lafayette, Ind.
7. "Ten Billion Little Dams" and other bulletins, U.S. Department of Agriculture, Washington, D.C.
8. "Units on Conservation" by Anne Raymond, Albuquerque, N.M.
9. Good charts may be obtained from American Potash Institute, Inc., Investment Building, Washington, D.C., and National Fertilizer Association, Investment Building, Washington, D.C.

VI. Additional activities

1. Invite local Farm Adviser or agriculture teacher to give a demonstration of soil testing. Collect samples of soil and test them.
2. Prepare blackboard demonstrations, depicting methods and advantages of contour farming, strip farming, crop rotation, grass waterways, and so on.
3. Show the same methods and advantages through the use of glass slides.
4. If possible, take pictures of portions of farms where above practices are used, and project on screen with opaque projector for the purpose of discussion and illustration.
5. Prepare glass slides with diagrams showing source of rivers or streams, how land is eroded, and so on.

Since opaque projectors make it possible to present 6″ x 6″ or 8½″ x 11½″ or larger areas of flat objects on a screen, pupils could very easily prepare their original drawings or favorite pictures for use in this manner. In addition they could use actual photographs which have been taken for this purpose by a member of the group. When a picture is projected on a screen, an excellent opportunity for an oral report is again provided.

If the picture can be placed in the opening, it can be projected on the screen. However, if pictures are to be filed for future use, they should be mounted. The following directions are easy to follow when mounting the pictures for use in the opaque projector:

1. If possible, illustrations should be 6″ x 6″ or smaller.
2. A medium-weight, neutral-color mounting cardboard should be used.
3. The cardboard should be cut the same shape as the platon. An extra inch, or a small thumb space, should be allowed on righthand side. This provides space for better filing index information and greater ease in handling.

4. Pictures should be cut straight and mounted evenly and smoothly on the cardboard.
5. Picture must be centered on cardboard, allowing for the extra space on the righthand side.
6. The back of the picture should be covered with adhesive tape and the picture carefully pressed to the mount, working from top to bottom.
7. It is important to remember that the picture or illustration will be inverted when placed in the projector.
8. It is often desirable to place a brief title or explanation on each mount.

Language arts

1. Read widely concerning the history of conservation and various conservation practices throughout the country.
2. Prepare oral and written reports to present to the entire group.
3. Write letters requesting information on the subject of conservation.
4. Write invitations to resource people to visit school or talk at special meetings.
5. Prepare original play or puppet show depicting various conservation practices.
6. Make movie to tell story of conservation of soil, coal, or some other phase of conservation program.
7. Conduct round-table discussions.
8. Keep an up-to-date word list.
9. Prepare a 15-minute broadcast.

Social studies

1. Study geographical factors of region and picture on maps and glass slides.
2. Survey the historical background of the community to determine benefits derived from past conservation practices.
3. In the sand table show soil arrangement for contour farming, strip farming, and other conservation practices observed when on field trip.
4. Prepare a map of own farm showing location of different crops, and illustrate or explain methods of conservation practiced in each.
5. Prepare and present informational program over local radio station.
6. Listen to one of many radio programs that are often prepared by F.F.A. groups in neighboring high schools and presented over the local station.

Listening to Radio Programs

In making preparation for listening to a radio program, the teacher or some of the pupils should get all available information concerning the program to be presented. This may be done either by contacting officials of the radio station for any advance publicity they may have or by writing to, or talking with, the teacher or some of the students preparing the broadcast.

With such information available to the group, more reading of related material can be done before listening to the program. A much more thorough preparation is possible, and questions which they cannot answer to their satisfaction but hope to hear discussed on the radio can be listed by the group in advance. Perhaps certain students will want to be especially responsible for particular questions. Possibly there need be no distinction of such responsibilities, but each child will try to get all he can from the entire broadcast, and in the discussion that follows his interpretation of some point may bring in an entirely different point of view for the rest of his classmates.

Before time for the broadcast a careful check should be made to see that all materials or equipment that will in any way help the students to understand and profit from the program are properly placed. For instance, if the broadcast should be concerned with special conservation practices on some farm which the listening students have visited, any maps or charts which they have made or pictures which they might have taken should be strategically arranged where they can best be seen by all.

Where possible, it is often desirable to have listeners arranged in an informal, comfortable, good listening position near the radio. If a list of new words is to be kept during the broadcast, someone should be assigned that responsibility, or each student may list the terms used that are new and unfamiliar to him, and then a group list may be compiled at the conclusion of the program.

A general spontaneous discussion will undoubtedly take place immediately following the broadcast. It should include controversial points presented as well as information gained and should stimulate further "reading to find out." Many other worthwhile activities may result from this type of program, depending upon its type as well as its suitability for the listening group. How profitable it will be, will depend largely upon the ingenuity of the teacher and the interest of the listening group.

Fine arts

A. Music

Learn to sing, play, enjoy, and appreciate the songs and folk games which are especially significant in the parts of the country where conservation practices are being studied.

B. Art

1. Prepare maps and glass slides to illustrate particular phases of conservation.
2. Make freehand drawings.
3. Arrange a table display of conservation materials.
4. Choose cartoons which appropriately present conservation practices.
5. Prepare a bulletin board exhibit which depicts the progress made in practices adopted in local community.
6. Select pictures or landscape paintings especially representative of local area.

PICTURES

There are many very lovely landscape pictures or paintings which would be excellent for study in connection with "Conservation of our Natural Resources." No attempt is made here to specify any one particular painting or picture, for teachers or students in different localities would be most capable of selecting the ones which would be most typical and most beneficial to them. It is not always necessary to use a famous masterpiece, for many appropriate and beautiful pictures can be found in magazines and pamphlets available at school and home. There are, however, certain principles to be considered in making the selection:

I. Purpose

A. Picture may be selected
  1. To show different surface conditions in the area
  2. To show natural coloring of vegetation
  3. To picture wild-life sanctuaries
  4. To depict nature's method of wild-life protection through adaptation of color to environment

B. Picture may be used to encourage original work by pupils.

C. Picture may serve as inspiration and help to develop keener appreciation of local beauty spots.

D. Picture may be used to discuss proper hanging of framed pictures in school and at home.

II. Presentation

A. Picture may be introduced to entire group during general discussion with some of the above-mentioned points stressed at this time.

B. Picture may be correctly placed in the room to be "discovered" by individuals and appreciated and informally discussed for a while before being used for group discussion.

III. Follow-up

A. A study of pictures in the room might bring about some changes in the location and hanging of the pictures.

B. Pictures which have been in frames in the room for some time might be temporarily replaced by appropriate pictures of the same size.

C. Original sketching, coloring, or painting of local beauty spots (such as were referred to in the stanza of "America the Beautiful" used earlier) may be encouraged.

D. Students who become conscious of some of the very beautiful pictures to be found in magazines, on calendars, and so on, may wish to start a collection, file them, and accept responsibility for changing the ones in the classroom when desirable and possible.

It is impossible to estimate the aesthetic value of such an activity in the lives of the pupils at home as well as at school. Thus, any of the above suggestions which might be used should be carefully adapted to the needs of the local pupils. Others should be added as the need arises and as the opportunity is presented in individual classrooms wherever such activities are being carried out by teachers and pupils.

Mathematics: Collect statistics and show by graphs the monetary gain to the farmer who practices conservation.

In conclusion, it must be remembered that these are only suggested activities. A good teacher will use many more, which grow naturally out of the program and which are of immediate and vital importance to her own situation. Possibilities are unlimited—except possibly by time—and the wise teacher will so encourage and stimulate her pupils that conservation practices will continue as a part of the daily program of the pupils wherever they go. Much of the success of any such unit of work can be determined, not alone by the interest in the plans made for such activities but by the actual application of these practices—both now and in the future.

This is an excellent type of program to supply an abundance of material for an extended community project. Perhaps the pupils could initiate such a study by presenting, at a program to which the community is invited, some of their findings on the subject. A request for help and suggestions for continuation should stimulate the cooperation of those in the community. The film "Conservation of Natural Resources" might be presented again at this time.

See the references at end of Chaps. 14 and 16.

18

USING AUDIO-VISUAL AIDS IN THE HIGH SCHOOL

The basic principles to be observed when using audio-visual materials are applicable to both elementary and high-school subjects. However, because high-school work is more departmentalized, the materials used are limited to more specific purposes. Further, in the high school, more than in the elementary school, these materials may be used to arouse the curiosity of the student and to stimulate thinking. This point is worth emphasizing.

Perhaps the mind of the high-school student is not more active than the mind of the elementary school pupil, but at least it is capable of reaching out farther, of organizing better, and of interpreting more accurately. Therefore, an important function of the use of audio-visual aids in the high school is to arouse curiosity about extensions, other applications, and further developments that provoke continued and additional mental activity that is pertinent. An aid that completely satisfies a felt need and does not incite to this additional mental activity is an aid that has been incorrectly and incompletely utilized.

For this section several illustrative plans in different subject fields have been selected. In some of the lesson procedures only one aid is used; in others several aids are correlated to develop a certain topic. Space does not permit including examples of the use of each aid in each of the various subject areas. However, the basic principles and procedures for using each of these materials are similar regardless of the subject in which it is used.

SOCIAL SCIENCE [1]

"Was Hitler to blame for World War II?"

"Where did the fighting start in World War II?"

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[1] By Dr. Harriet Stull, Social Science Department, Western Illinois State College, Macomb.

"Were countries in Europe ready for World War II ahead of time, too?"

Questions like these show how keen is student interest in World War II. The record album, Then Came War: 1939,[2] arouses further interest and may serve as a point of departure for the students in raising additional study problems. In spite of certain limitations—the large amount of material presented in a short space of time and the complexity of some of the detail, for example—these records are useful in establishing a common classroom experience as a basis for further study. Their use in an eleventh-grade American history class as a basis for two days of work will be described here. In general the classroom procedure is as follows:

First day:

1. Preparation of class for listening to records
2. Playing of records (approximately 20 minutes)
3. Discussion of overview questions and listing of main events

Second day:

1. Completion of preliminary listing
2. Second playing of records
3. Correction and discussion of list of events
4. Raising of questions for further study

During the class period, activities are directed toward the achievement of these understandings:

1. Suspended or qualified judgments are necessary in evaluating recent world events.
2. The problems that led to World War I were not solved by military action and remained to pave the way for World War II.
3. The inadequacies of the Treaty of Versailles contributed to the rise of Hitler to power.
4. The world lacked effective political machinery to deal with the problems that led to war in 1939.

The record album, the Sound of History: Then Came War: 1939, with commentary by Elmer Davis, forms the basis for the classwork. A wall map of Europe as it was in 1939 and the students' textbooks are also needed.

In introducing the records, the teacher refers to some of the questions raised by students about World War II when this subject was selected as one of their problem areas. Then Came War: 1939, the students are told, will start them toward an answer to some of their general and specific

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[2] World Book Company, Yonkers, N.Y.

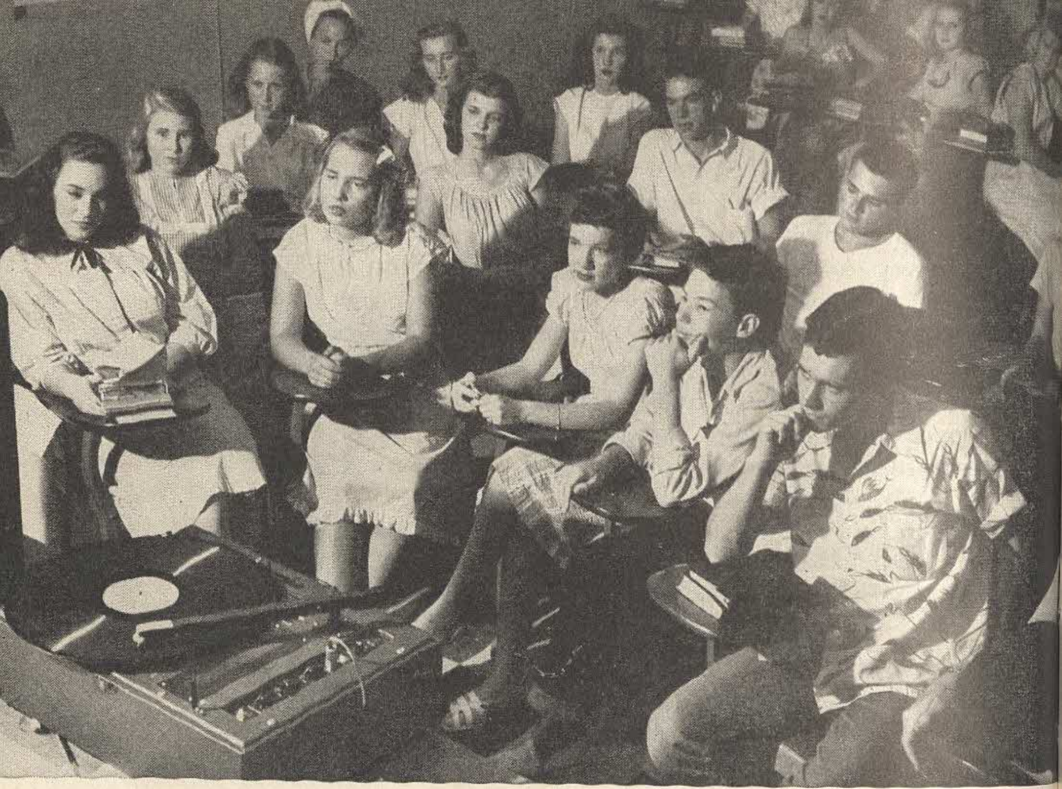

FIG. 1. Establishing a common classroom experience as a basis for further study. (*Courtesy of Phoenix, Ariz., Union High Schools.*)

questions and will assist them in forming questions for their unit study. After the class has helped in identifying the commentator, Elmer Davis, the teacher asks the students to recall certain facts from earlier unit studies. As the teacher puts the following questions on the board, the students draw on their memories, class notes, and textbook to remind themselves of the basic facts.

1. What were the basic causes of World War I?
2. What provisions in the Treaty of Versailles did the German people resent most?
3. What countries had German minority groups included within their borders by this treaty?
4. What were the chief weaknesses of the League of Nations?

The wall map is next used to orient the students geographically. They first make a list of the countries that had a common border with Germany in 1939 and locate places that will play an important part in the record script—Memel, Danzig, Polish Corridor, Sudetenland, Munich. The terms "non-aggression" and "ultimatum" are also added to this list of names and discussed.

As the students listen to the records, they take a few notes that will help them to answer certain questions:

1. What part did the United States play in the events described in these records?
2. What causes of World War I also play a part in the background of World War II?
3. What important events are mentioned in these records?

The teacher then plays the six records without interrupting the listening period for any planned discussion, dealing briefly with such student questions as may arise. For example, after listening to record 2, some student is sure to ask, "Was that really Hitler's voice?" Perhaps a student will recognize and comment on the snatches of the *Warsaw Concerto* played in records 3 and 4. During the time when the records are being changed, the students may also wish to add to their notes and prepare for the class discussion.

In the parallel columns below are shown the kind of questions that may be raised by students and the teacher and the kind of subject matter that will be drawn in as these questions are discussed. The list of events appearing in the righthand column in answer to question 3 is prepared by the teacher in advance. Actually a list similar to this will develop from the cooperative efforts of the class as they listen twice to the album.

Key Questions	*Subject Matter*
1. What part did the U.S. play in the events described in the records? Why are events like the Washington Naval Conference not mentioned?	1. U.S. retires from international responsibilities. At time of Polish crisis, U.S. offers diplomatic service. U.S. is notable for its absence.
2. What causes for World War I are again found for World War II? What examples are given here to show the common causes?	2. Nationalism. Example: German national group in Austria is a source of trouble. Imperialism. Example: German loss of colonies is referred to by Hitler. Alliances. Example: Apparently there are secret elements in Non-aggression Pact. Militarism. Example: Armies of all powers are mobilized for action before war is declared.

Key Questions	*Subject Matter*
3. What are the main events described by Elmer Davis? What questions do you have about each event?	
a. How is the end of this war shown dramatically? Was it really the end of the war?	*a.* World War I ends in 1918.
b. What evidence is given to show its inadequacies? What part did the U.S. play?	*b.* The League is established but proves inadequate.
c. What conditions in Germany contribute to the rise of Hitler? Which of these conditions can be traced directly to World War I?	*c.* Hitler rises to power in 1933.
d. What is the attitude of most European powers toward this act? Why do they take this attitude?	*d.* Hitler acquires Austria in March, 1938.
e. Why does Hitler make this demand on Czechoslovakia? How does Mussolini aid Hitler? Why are Czech and Russian representatives not allowed to participate in these meetings? What effect does German control of Sudetenland have on Czechoslovakia's military position?	*e.* Hitler's demand for Sudetenland is met at Munich in September, 1938, by France and Britain.
f. How does this act compare to Hitler's statement in September, 1938? What effect does it have on the thinking of political leaders in France and England?	*f.* All of Czechoslovakia comes under German control in March, 1939.
g. From what country does Hitler take Memel? What might be his reasons for wanting it?	*g.* Hitler retakes Memel, 1939.

Key Questions	*Subject Matter*
h. In what ways does the Polish crisis remind you of the earlier Czech crisis? Why is the same pattern used by Hitler? Is Danzig a Polish city? Who is the German leader in Danzig?	*h.* Danzig becomes a trouble spot as Hitler and the Germans there ask reunion with Germany in March, 1939.
i. How does the British and French attitude toward Russia differ in this crisis? How do you explain this difference? Why does Germany want the nonaggression pact? Why does Russia want it? Why does Davis suggest that there probably were secret clauses in the pact? Do his reasons convince you?	*i.* French and English hopes for an alliance with Russia were dashed in August, 1939, as Russia and Germany sign a nonaggression pact.
j. What actions do the French and British take to show they mean to back up their pledge? Why is the loss of Danzig so important to the Poles and their new allies?	*j.* France and Great Britain pledge Polish territorial integrity as Danzig declares virtual alliance with Germany, August 23 and 24.
k. Why is Pope Pius a leader in this? Why does Hitler reject Roosevelt's offer to mediate? Where is the League of Nations?	*k.* Peace negotiations suggested by Pope Pius and President Roosevelt are accepted by Poland but not by Germany.
l. What answer does Hitler give to Daladier? What promises does Henderson hold out to Hitler if he will abandon demands on Poland? What military action taken by various nations parallels these events?	*l.* Daladier gives a warning, and Henderson appeals for negotiations as troops mobilize on August 26 to 29.
m. What are the usual diplomatic channels used to negotiate dif-	*m.* Hitler makes negotiation suggested by Henderson virtually

Key Questions	*Subject Matter*
ferences? What difficulties does Hitler put in the way? Do you think these are deliberate?	impossible on August 29 and 30.
n. Do border skirmishes necessarily lead to war? Why does this one? What do you think of this statement made by Hitler: "All the suggestions which I have made for peaceful solutions have been rejected."	*n.* Hitler declares a state of war exists after reported border attack by Polish soldiers on August 30 to September 1.
o. Why do France and Britain act now when they didn't in the earlier crisis? Why does Hitler receive two ultimatums? How do they differ?	*o.* Following the Polish request for aid, France and Britain give two ultimatums to Hitler warning him of their intention to support Poland, September 1 and 2.
p. Compare the way in which Daladier and Chamberlain announce a state of war. How did alliances again draw the great powers into war?	*p.* Hitler's refusal to accept negotiation brings a declaration of a state of war from Britain and France on September 3.

These questions and subject matter suggest the general content and approach in the use of these records. In order to move toward the forming and organizing of additional study problems, the teacher again plays the concluding speech by Elmer Davis.

"But to draw final conclusions as to the meaning of those events now is premature. Much that is untold lies behind the bare diplomatic exchanges—maneuvering for power, desire to be cleared of responsibility for war, earnest efforts for peace and justice. To make the distinction between the genuine and the false, between verified fact and mere rumor is not easy in times like these. We must always check for accuracy, completeness, and impartiality; keep ourselves alert to learn the truth. For years historians will investigate and verify and interpret the complex causes and the meaning of this conflict. And men of good will of all nationalities will try to profit from this lesson as they continually strive to build a humane world order from which the threat of violence is removed."

This speech leads into a discussion of such questions as these: Why may it be easier "to make the distinction between the genuine and the false" now than it was in 1939? What materials will be useful to the class in making these distinctions? What resources may a historian have by 1990 that are not available now? What subjects must we get more information on if we are to understand what lay behind World War II?

As suggested here the records serve several functions in the American history class: they help to capitalize student interest in the new unit; contribute an overview of the important part of the content of the unit; and give a common basis of knowledge as it serves as a point of departure for additional problems. The plan of study demonstrates one way in which students and teachers in the modern school may utilize source material in the discussion of the complex problems of the present-day world.

THE AIRPLANE CHANGES THE WORLD MAP[3]

The recent events in Europe, which prompted President Truman to ask for resumption of the draft and for immediate passage of some form of universal military training, emphasize the need for better international understanding. To build a world in which people can live in peace, one must know something of the people who inhabit the earth and, in addition, more about the world itself. This lesson, through the study of maps, is designed to give the students a better understanding and appreciation of the world on which we live.

Main objectives:

1. To teach students that the flat wall map (Mercator) does not give a true picture of the world and to point out that most of their ideas about the world, which are based upon their study of flat maps, are misleading and erroneous.
2. To teach that the airplane and the study of the world in its true global proportions has changed our thinking in terms of peace and war, travel distances, what constitutes a neighbor, international trade, and the so-called "hemispheres."

Minimum basic materials needed to teach this unit:

1. A large globe of the world
2. A flat wall-type Mercator map
3. Several pieces of string 2 ft. in length
4. A hollowed grapefruit.
5. The film, "The Airplane Changes the World Map"[4]

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[3] By John W. Griffith, Director of Audio-visual Education, Galesburg, Ill.

[4] Encyclopaedia Britannica Films Inc., Wilmette, Ill.

Procedure prior to showing of film: Create class interest in this lesson by using some or all of the following procedures:

1. Have class study large Mercator map and ask them to report on relative size of Mexico and Greenland.
2. Have students demonstrate on Mercator map the shortest route between Tokyo and the Panama Canal.

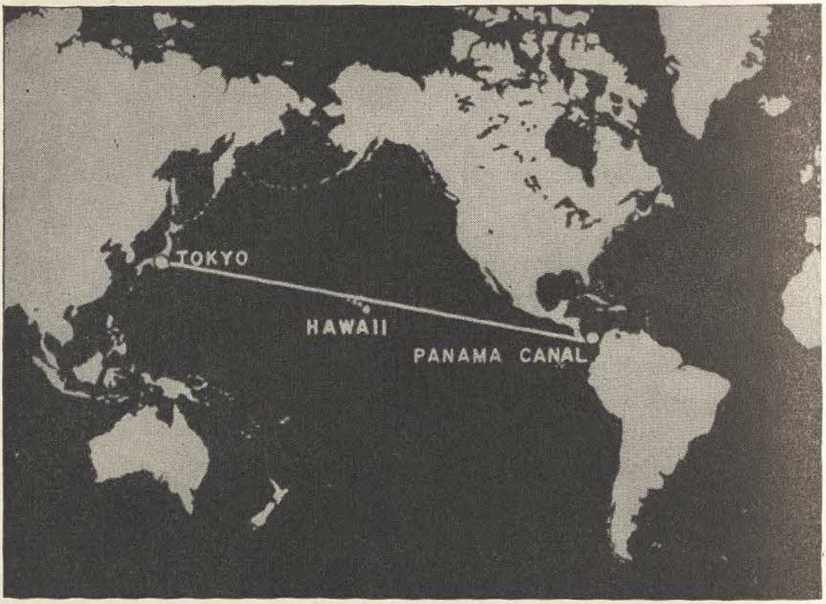

FIG. 2. Here we see the inaccurate and false conception of the world produced by the Mercator flat map projection. A straight route from Tokyo to the Panama Canal would cross the Aleutian Islands and the United States in the vicinity of Denver, Colo.

3. After students have reported their findings of the above two projects, tell them they are completely wrong and proceed to prove it or have a student prove it by using a string on a large globe of the world. This will, no doubt, lead to discussion of what is right about a Mercator map, how it is made, and why it is distorted and inaccurate.
4. Next take the grapefruit shell and demonstrate what happens when you attempt to flatten out the global world. This will demonstrate the idea of Goode's Projection and show how either a wall map or textbook map, although it represents true or real proportion, breaks up unity and continuity.

5. Next show a polar-centered map and explain how it is made. Explain that if one covered the globe of the world with a thin layer of rubber and traced the land and ocean outlines upon it; placed a thumbtack at the North Pole; cut a small hole in the rubber at the South Pole and then had several people pull out in all directions from the South Pole until the rubber was flat, he would then have a polar-centered map. Ask the students if they were to do this where the greatest distortion would come and why? Ask the students why distortion in the Southern Hemisphere of the world is less important than in the Northern Hemisphere. In the polar-centered map what part of the world becomes a hub in direct air travel distances?

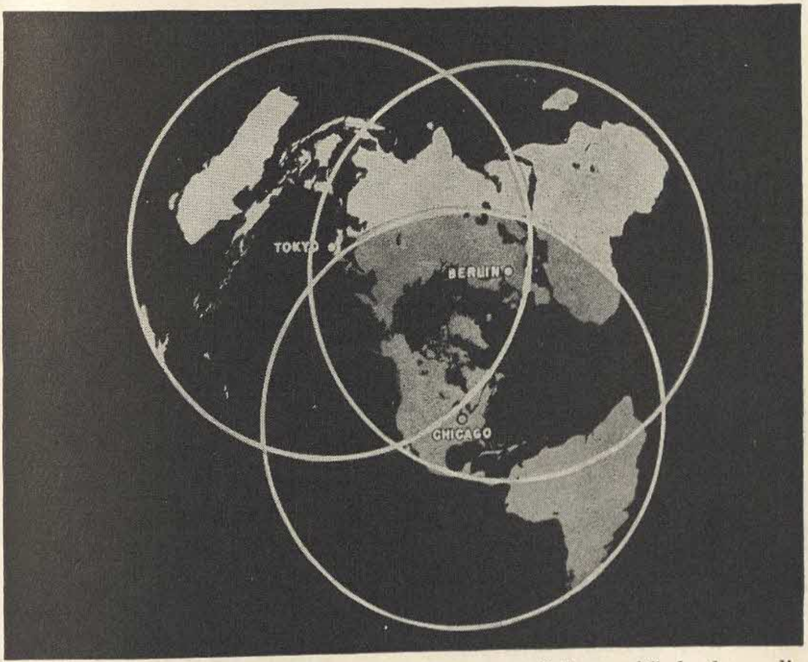

FIG. 3. This polar projection map reveals how most of the world's land mass lies in the Northern Hemisphere and consequently is easily accessible via the great circle air routes.

6. Have a student point out the so-called "Eastern" and "Western Hemispheres" on a Mercator map. Next take the globe and show the northern and southern halves, commenting upon the possibility of perhaps more accurately speaking of Northern and Southern Hemispheres.
7. Ask the students to name the countries to which we refer when we use the term "Good Neighbor Policy." Now ask just what the term "neigh-

bor" implies and proceed to show them with a string on the globe that Moscow is closer to Washington, D.C., than is the so-called "neighbor," Buenos Aires, capital of Argentina.

This should lead to discussion as to how the airplane and communication has made *one world* and all people next-door neighbors. Point out that the whole world is smaller in terms of traveltime than the original 13 colonies along the Atlantic Coast.

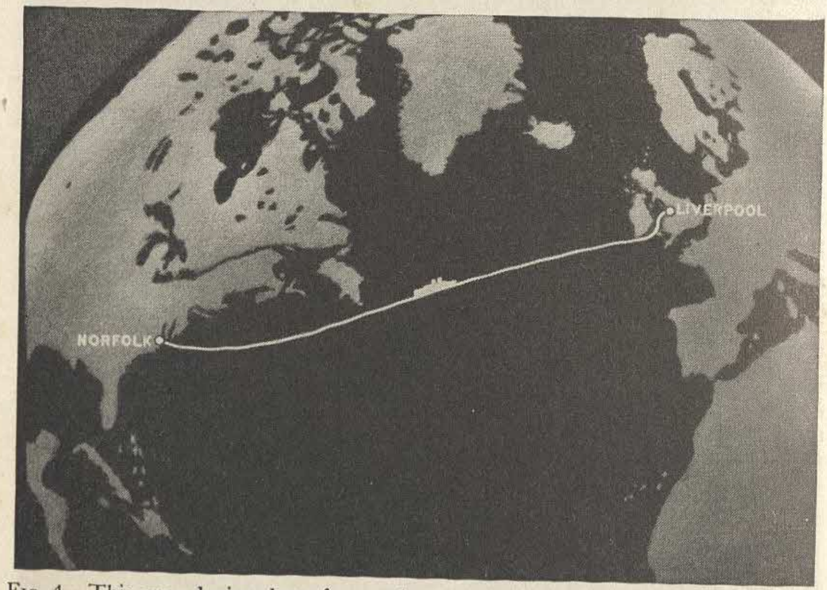

FIG. 4. This map depicts how far north a steamship travels when going in a direct line from Norfolk to Liverpool.

8. Describe and illustrate on the globe the latitude and longitude lines and tell the students to watch for additional explanations of this in the film they are about the see.
9. Tell the students to watch for an explanation of the term "Great Circle Route."

Showing the film: Next show the film, "The Airplane Changes the World Map," asking the students to watch for examples of what has been discussed.

Follow-up procedure:

1. Ask students if they have any questions concerning material seen in film.
2. Check their understanding of the film by such questions as:
   a. What was the conception of the world in Homer's time?
   b. Did Columbus believe the world to be round?

- *c.* How did Mercator make his flat map of the world?
- *d.* Why is there distortion in the Mercator map?
- *e.* In terms of national defense against Japan, which was more important—a strong Hawaiian base or a strong Alaskan base? Why?
- *f.* Describe Mollweide's and Goode's projections of the world.
- *g.* What do we mean by Great Circle Routes?
- *h.* Describe the strategic importance of the Arctic regions in the world of today.
- *i.* Just how small is the world in traveltime today?

Now show the film once more to clear up any misconceptions and follow with a globe and Mercator map study using pieces of string, finding answers to such questions as the following:

1. What is the relative distance from Moscow to Seattle; Washington and Charleston, S.C.?
2. Which is closer to your home town, Moscow or Buenos Aires?
3. Which one of the following is closer to Japan: San Diego, Calif., or Grand Forks, N.D.?
4. Compare distances between Minneapolis and the capitals of Europe, and Minneapolis and the capital of Argentina.
5. Describe the most direct route from Tokyo to the Panama Canal.
6. Compare the most direct plane routes on the Mercator map and on the globe from New York to London.
7. Compare the size of Greenland as you find it on the Mercator map and on the globe.
8. Locate Berlin, Germany, and Rio de Janeiro by latitude and longitude.

Reference readings for students:

BAUER, H. A.: "Globes, Maps, and Skyways," The Macmillan Company, New York, 1942.

REED, W. M.: "The Earth for Sam," Harcourt, Brace and Company, Inc., New York, 1942.

RENNER, G. T.: "Human Geography in the Air Age," The Macmillan Company, New York, 1942.

SMALL, S. A.: "Boy's Book of the Earth," E. P. Dutton & Company, Inc., New York, 1942.

WE LIVE FOR A DAY IN COLONIAL VIRGINIA[5]

The film, "Eighteenth Century Life in Williamsburg, Virginia," clearly portrays Virginia during that era in a most interesting manner. The information is authentic and gives a background for social studies and American literature, while it also affords excellent teaching material for all the language arts. The content of this documentary film is suitable for junior high school, and the story is presented in such an attractive way that the pupils have an incentive for gaining the knowledges and skills suggested in the objectives listed below.

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[5] By Mary B. Wright, Principal, Junior High School, Farmington, Ill.

Objectives:

1. To teach pupils to observe carefully in order that they will have a better background for stories of America in the eighteenth century
2. To add new words to the vocabulary in order to discuss the pictures and stories intelligently
3. To learn to spell new words to use in writing stories
4. To lead pupils to read more widely in the history of the eighteenth century in America.
5. To recognize the ways in which action, color, sound, odor, height, or perspective are shown.

Subject matter: 16-mm. documentary film, "Eighteenth Century Life in Williamsburg, Virginia." [6]

First Day

Teacher's introduction:

"The eighteenth century is noted for some of the most significant events in our history—events which have had a marked influence upon our language arts. Knowledge of the French and Indian War, the Declaration of Independence, the Revolutionary War, and the establishment of our republic following that war is necessary in understanding the life of the people and the background of our American literature. The Industrial Revolution, too, had far-reaching effects.

"Customs and manners of the eighteenth century were very different from those of today. In this film, 'Eighteenth Century Life in Williamsburg, Virginia,' you may watch for these differences. Think especially of these: food, clothing, houses, occupations, and customs."

Show the film, without comment, for the purpose mentioned above. After showing the film discuss the above topics.

Second Day

"You have read several stories having settings similar to the picture we saw yesterday. (Setting means time and place.) Make a list of such stories."

[6] Eastman Kodak Company, Rochester, N.Y.

Suggested list:
"Bravery of Elizabeth Zane" (Blaisdell & Ball)
"Betty's Ride" (Canby)
"The Hawk from Cuckoo Tavern" (Lee)
"Paul Revere's Ride" (Longfellow)
"George Washington" (Scudder)
"Daniel Boone, Wilderness Scout" (White)

"Certain scenes or articles in the picture may remind you of other stories, as well as songs or paintings. I have listed 20 on the board. You may write the titles they suggest."

Articles in Pictures	Suggestions for Poems, Prose, Songs, or Paintings
1. Lamplighter	Stevenson's "The Lamplighter"
2. Robin	"Robin's Secret" or "Robin Red Breast"
3. Deer	"Bambi"
4. Well	"The Old Oaken Bucket"
5. Hay fork	"Maud Muller"
6. Watering trough	"The Watering Trough" (painting)
7. Shoeing the horse	"Shoeing the Bay Mare" (painting)
8. Fireplace	"Evangeline" or "Snow Bound"
9. Horseshoe	"The Nail" (story)
10. Meat on spit	"Hungry Hans"
Apprentice	
11. Blacksmith	"The Village Blacksmith"
12. Post rider	"Riding West with the Pony Express"
13. Horse	"Black Beauty" or "Smoky"
14. Negro with bucket	"Water Boy" (song)
15. Wig	"John Gilpin"
16. Spinning wheel	"The Courtship of Miles Standish" "There's an Old Spinning Wheel" (song)
17. Clock	"Grandfather's Clock"
18. Harpsichord	"The Lost Chord"
19. Oxen	"Ox-Team Days on the Oregon Trail"
20. Quotations at end	"The Village Blacksmith"

Third Day

"Write on the board the list of eighteenth-century stories you have read and the authors' names. We shall check for spelling and punctuation as well as for settings.

"Write on the board the list of songs, paintings, and stories suggested by the 20 articles. (Check for accuracy.)

"Tomorrow you may be ready to do one of the following:

1. Give a synopsis of one of these books you have listed. Use vivid words and clear sentences. Try to interest others in reading the books.

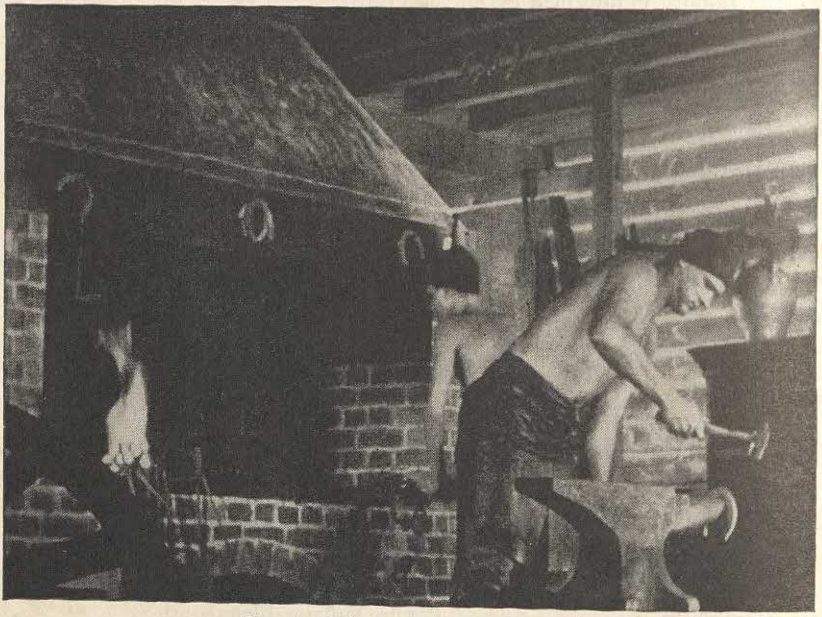

FIG. 5. The village blacksmith.

"And children coming home from school
Look in at the open door;
They love to see the flaming forge,
And hear the bellows roar."
—Longfellow.

(*Eastman Kodak Company.*)

2. Be able to read well orally one of the poems suggested.
3. Describe vividly one of the pictures."

FOURTH DAY

"Today you are to tell the class about a story or painting suggested by the scenes or articles in the film, 'Eighteenth Century Life in Williamsburg, Virginia.' Enunciate clearly and try to hold the interest of your audience. If you chose a poem, see how well you can read it."

Fifth Day

"This week, since seeing 'Eighteenth Century Life in Williamsburg, Virginia,' we have been talking about other eighteenth-century stories and pictures suggested by this film. Several new words were used. Watch for these words as we see this film the second time." (The teacher might, before class, list words which are new to most pupils. A slide could be prepared and used to focus attention upon them, before showing the film again. The words below are suggestive.)

1. Journeyman
2. Apprenticeship
3. Harpsichord
4. Cologne
5. Pewter
6. Skewer
7. Cabinetmaker
8. Gazette
9. Sassafras
10. Currycomb

"After viewing this picture again, you may imagine you are a member of the Kennedy household and write about your day's activities as if you had actually lived in Williamsburg in the eighteenth century. This may be written as a letter, a newspaper article, or a poem."

Show the film for the purpose of observing a day in the life of some individual in Williamsburg and for learning the new words. In addition to the list previously prepared by the teacher, pupils may suggest other words they noticed. Write these words on the board, have the pupils learn to spell them and to use as many as they can in writing their stories. Suggest that they make an outline first in order to help them tell their stories in logical order.

Sixth Day

"We shall read your stories to see if you have been able to use the new words in an interesting manner and have described vividly your part in the day's work at Williamsburg.

"Think of the things you have learned from this film. If there are some things you do not understand clearly, be ready tomorrow to find the points missed because then the film will be shown for the third time. Here are several questions which may help you." (These may be placed on the board or used in an opaque or lantern slide projector.)

1. What is the theme of this motion picture?
2. Does it have a plot?
3. How long a period of time is covered from the opening scene to the end of the picture?

4. Who are the characters?
5. What are the highlights of this day in the Kennedy family?
6. Compare the ways in which the Kennedys spent their evening with the ways in which families spend them today.

"We have already studied how color, action, and sound may make pictures more attractive and how size and perspective are shown. Think of the ways in which color has improved this film. Describe the scenes in which action is shown. Tell why sound is needed. Name the ways in which size and perspective are shown. Relate how odor and heat are indicated. Recall the things which definitely show that this era is in the eighteenth century.

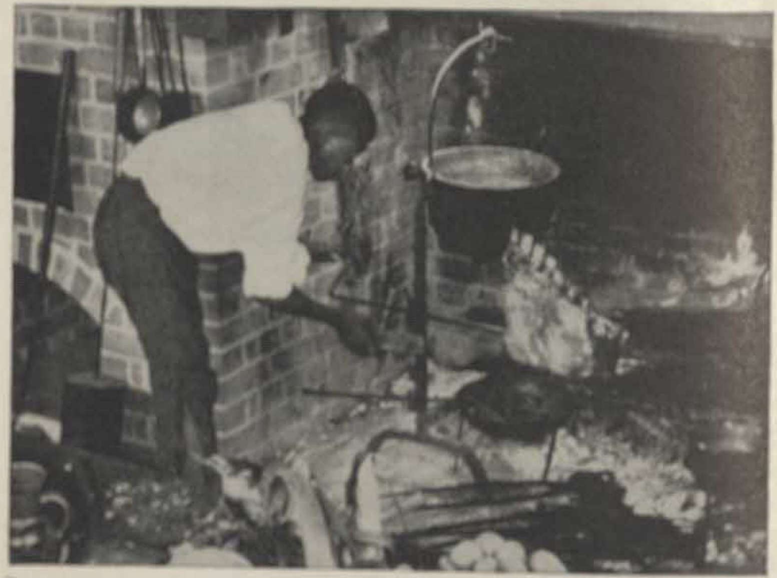

FIG. 6. Cooking was different in eighteenth-century Virginia. Compare methods and utensils used in eighteenth-century cooking with those used in modern homes of today. What are some differences in securing food? (*Eastman Kodak Company.*)

"Locate Williamsburg on a map. What famous college is situated there? If you are interested in learning how Williamsburg got its name, why it is important historically, how many buildings have been restored, or more about the life of the people there, you may use encyclopedias or some of the following books: 'Carry Me Back to Old Virginia,'[7] 'Let Time Relate,' 'Sports of Colonial Williamsburg,' 'Sonnets on Old Williamsburg,' 'Tales of the Tuckers' (stories of five generations of a Williamsburg family). Historical and humorous anecdotes: 'The City of Once-upon-a-time'; 'The Story of a Portrait,' Mary Haldane Coleman."

SEVENTH DAY

"There may be certain things you will wish to observe or review as we see this film for the third and last time. You should be able to find answers to all the questions on your study sheet." (Pupils should be given mimeographed copies of questions covering the points stressed during the entire study.)

EIGHTH DAY

Oral discussion: "Today you are to give us the information and new ideas you have gathered from reading various additional sources."

Assignment: "Collect pictures, write a poem, or work on handicraft for this unit. Have all material ready for tomorrow. The poems will be collected and arranged in a scrapbook. You may illustrate them, if you wish."

NINTH DAY

Have the best original poems read to the group. The dressed dolls and booklets or collections of pictures should be shown and described. If desired, the opaque projector may be used to show the collections of pictures.

TENTH DAY

Test

(Illustrative Exercises)

I. Completion:

1. Williamsburg is in the state of __________.
2. The 1700's are in the _____ century.
3. Water was carried in a bucket made of __________.
4. Water was heated in a __________.
5. Meals were cooked in a __________.
6. A boy learning a trade was called an __________.
7. Mr. Kennedy's work was __________.
8. Newspapers were published __________.
9. The women spent the evening __________.
10. The post rider brought the __________.

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[7] Division of Publicity and Advertising, Richmond, Va. The other books in this list are published by Dietz Press, Richmond, Va.

II. Matching:

1. __Harpsichord
2. __Gazette
3. __Stock
4. __Skewer
5. __Loom
6. __Sassafras
7. __Pewter
8. __Cologne
9. __Porridge
10. __Journeyman

a. Wooden pin for keeping meat in place
b. Newspaper
c. Metal
d. Wooden frame to hold legs or hands as a punishment
e. Machine for weaving
f. One who has served his apprenticeship
g. Perfume
h. Root with a spicy smell
i. Musical instrument
j. Oatmeal

Evaluation:

1. To what extent do the pupils have a better background for stories of America in the eighteenth century?
2. Have they learned new words from the study of this film?
3. Can they spell these words correctly? Use them?
4. Are the pupils interested in reading more widely about this period of our history?
5. Do they observe carefully and recognize the qualities which add interest to pictures?

USING THE PROJECTED STILL PICTURE TO PREPARE FOR A FIELD TRIP [7a]

The audio-visual materials used to develop a given unit of work or a certain lesson procedure should be chosen to meet a definite need. The aids selected for the development of the following plan were 2″ x 2″ slides and flat pictures for opaque projection. The major purpose in using these materials was to give the students a better understanding and appreciation of the author whose life and work they were studying and to prepare them for a visit to his home town.

Most of the students in any American literature class will have read one or more of Mark Twain's books while in the grades, or during the first years of high school. As a result, they have some background for the work when they are ready to study Mark Twain in detail.

Some three or four weeks before the class is ready to begin this study of the great humorist, the teacher assigns to each either a well-known biography of Mark Twain or one of his novels. Popular novels are "The

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[7a] By Mrs. A. B. Roberts, Colchester High School, Colchester, Ill.

Prince and the Pauper," "Puddn'head Wilson," "Life on the Mississippi," "Innocents Abroad," "Tom Sawyer," "Huckleberry Finn," and "Connecticut Yankee at King Arthur's Court." Collections of short stories are also valuable. Suitable biographies are "Boy's Life of Mark Twain" by Albert B. Paine and "My Father, Mark Twain," by Clara Clemens. "River Boy," by Proudfit, although rather elementary, reflects many interesting facts concerning the author. At the end of this reading period, two or more class periods are used for a discussion of these books.

During these two or three periods the facts discussed and the pictures viewed will give to each student a knowledge that will increase his anticipation and make his trip to Hannibal all the more interesting and functional. These discussions reflect such points as settings, local color of the Mississippi, characters from the stories, style of writing, and general contribution to the field of American literature. The students are led to appreciate Mark Twain's peculiar and subtle type of humor, often infused with a worth-while idea but never biting or sarcastic.

Perhaps the most interesting part of the study is the trip to Hannibal to see the home of Mark Twain, the neighborhood where as a boy he and his gang roamed, and the cave where he and Becky were lost. In the preparation for the trip various visual aids are used. On 2″ x 2″ slides, pupils see the picture of Hannibal and the location of the old steamboat landing. They are led to think of the importance of river transportation during the early nineteenth century, as well as to enjoy the stories of the famous steamboat races which took place on the Mississippi.

As they look at the rear view of the boyhood home, they recall various incidents of his boyhood which Mark Twain describes in "Tom Sawyer": the story of the "water cure," given to him by his mother in the little back shed, when all other quack remedies failed to cure him of his infatuation for Becky; how he had to help the Negro boy cut kindling in the little back lot; coming home late and climbing up the rain pipe; and of sneaking out after he had gone to bed—all these become more realistic when students see the photograph of the spot where they happened. Even a description of the lovely rose garden at the back of the house, where Mrs. Clemens raised tomatoes and gimpson weeds, is intriguing.

The southwest corner of Hill and Main Streets is an interesting picture, for here are located three buildings which have a very definite connection with Mark Twain's boyhood. On the corner is the "house of the pilasters" in which the Clemens family lived while they were building their home. Years later when they lost the home, they moved back into the upstairs of this building. The building beside this structure is a hotel which figures in the story of "Tom Sawyer." The three-story building next to the hotel is the one in which Twain learned the printer's trade. The outside of these three buildings is much the same as it was in his time. On the trip students may go into these places and look about.

Another slide shows the old building in which John Clemens had his law office. From this, students can get an idea of the unpretentious little village of Hannibal during Mark Twain's boyhood. In the background of this same picture is Cardiff Hill, the playground of the gang.

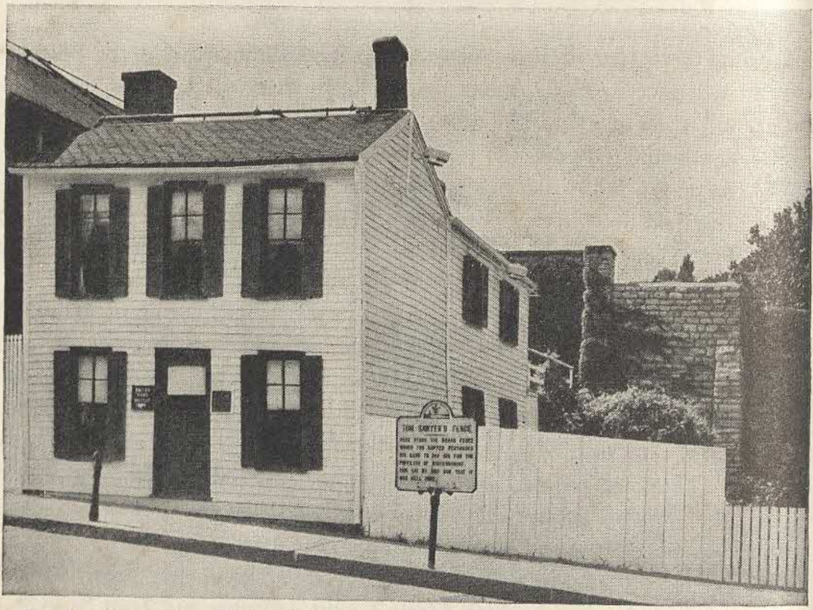

FIG. 7. Mark Twain's boyhood home and the site of Tom Sawyer's fence.

The Mississippi River had a great attraction for all the boys of Hannibal. A set of pictures showing the boyhood playground would not be complete without a view of the river and Jackson's Island. When this picture is on the screen, students like to talk about the pirate adventure from "Tom Sawyer" and the story of the gang's attendance at their own funeral. Students usually remember also that in "Huckleberry Finn," Huck found Nigger Jim on this island and tried to help him escape to the Ohio River.

Up Hill Street, a short distance from the boyhood home, is the alley at the end of which was located the old tannery where Huck Finn lived. This scene brings to mind many of the pranks which Twain tells about in "Tom Sawyer." Beyond the alley, the pupils can see Cardiff Hill and the lighthouse which is a memorial to Mark Twain. As the students look at this picture, the instructor tries to give them some idea of what they will find here on their visit.

Mrs. Laura Hawkins, better known as Becky Thatcher, was a lifelong friend of Mark Twain. The picture of her home, almost directly across from the home of Mark Twain, helps students to recall many incidents of Twain's early life in which Laura Hawkins had a part. It is interesting to know that on their last visit to Hannibal, when they were both in old age, they went for a walk together up to "Lovers' Leap" where they had so often played in the days of their youth.

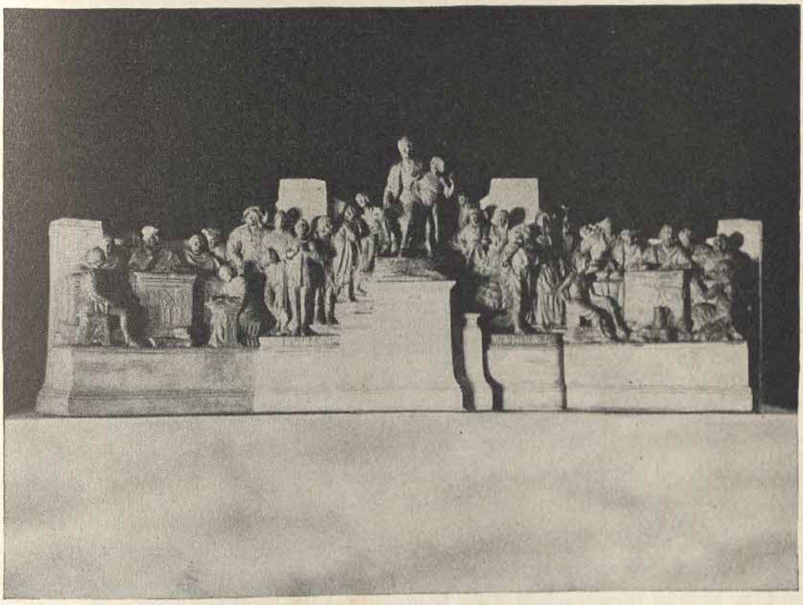

Fig. 8. Group statue of Mark Twain characters, Hannibal, Mo.

Another visual aid which can be used is the opaque projector, by means of which pictures taken from a Mark Twain folder are shown to the class. The first picture is the one of the home with the museum to the left and the replica of the famous board fence to the right. The home is furnished as nearly as possible as it was when the Clemens family lived in it: the writing desk which Mark Twain often carried with him on his journeys; the walnut drop-leaf table and buffet; and the great platters and tea sets in the china closet. In the kitchen are the long-handled waffle iron which was used over the fire, two different styles of fluting irons, candle molds, an old coffee grinder, and huge gourds, used for water pails. Upstairs, at the rear, is the bedroom in which Twain and his brother Henry slept. The trundle bed always intrigues the students.

Pictures of the museum show articles which belonged to the Clemens family and other pertinent items—a pilot wheel of a river boat, the orchestrelle which Mark Twain himself built, the cap and gown which he wore when Oxford presented him with an honorary degree, the cane chair that was his favorite, and many other items. On the plaque of the Mark Twain Memorial, designed by Walter Russell, are pictured many characters from the novels, and the students may identify these.

Another picture shows the monument to Tom Sawyer and Huckleberry Finn, the best known and best loved of all Mark Twain's characters. This bronze monument, located about two blocks from the home, shows Huck in rags, as he always was because his father was the town drunkard. The monument is appropriately placed at the foot of Cardiff or Holliday Hill, where so many of the exploits of the gang took place. In Twain's day there were few houses on the Hill, and it was a natural playground for the boys. A Mrs. Holliday, the counterpart of the Widow Douglas in "Tom Sawyer," owned the Hill. In the centennial year, 1935, the lighthouse was built on the top of the Hill and during the celebration the light was turned on by President Roosevelt in the White House at Washington. From the top of the Hill there is a beautiful view of the river, the islands, the new Mark Twain Bridge, and Lovers' Leap in the distance.

To many of the students the cave is the most interesting part of the trip, and a picture of the entrance introduces this topic, although this entrance was not known in Mark Twain's time. The old entrance is up the hill and to the left. This cave was a favorite play spot of Twain and his friends and is the setting of a number of episodes, the best known of which are the story of Indian Joe who found gold buried in it and, finally, after having lived on bats for some time, starved to death there; and the story of the Sunday School picnic when Tom Sawyer and Becky Thatcher got lost in it. Incidentally, this cave is a fine example of the work which water does. Later, when the trip is made, if the weather is warm, the group will enjoy eating lunch on the lawn in front of the entrance.

A final picture shows the monument in Riverview Park—a bronze figure of Mark Twain facing the great river he loved. Carved on the pedestal is the inscription, "His religion was humanity, and the whole world mourned for him when he died." From this point the students can see several miles both up and down the river.

After the members of the class have read and reported on the novels and biographies, discussed the work of Mark Twain as a writer, and seen the pictures and talked about the incidents which they reflect, interest in the coming trip should be greatly enhanced. The over-all plan should be such that the students make the trip immediately following this preparation.

After the trip the follow-up work may be assigned as the supplementary

English projects for the following two weeks. Students nearly always take cameras on the trip, and while in the museum, they buy views and post cards. A worth-while project is to make a booklet containing the description of the trip, fitting in the pictures taken and purchased. A good mounted picture of Mark Twain might also be included.

As a culminating activity the pictures taken may be presented by the members of the group in an illustrated lecture to the student body, PTA, or community clubs. For this purpose either the opaque or 2″ x 2″ projector, or a combination of the two, may be used.

THE USE OF FILM DIALOGUE IN LANGUAGE TEACHING [8]

Since the values of foreign films for modern language classes have been well established, discussion can now be limited to particular techniques of presentation. These are, of course, necessarily governed by the purpose for which a foreign film is shown. These films may be used for (1) dialogue practice in conversational skills, (2) the presentation of materials for building up background and association, and (3) for teaching a foreign literature.

The use of film dialogue for practice in conversational skills fulfills a function which few activities of the language class have yet been able to supply. Sometimes we hear a child say, "I am going to Europe with my parents next summer so I must learn to speak well," and we find that his interest needs no further artificial prodding and remains high for an entire ten months. But for the child or even the older student who is not going to Europe in the immediate future, every help must be employed toward obtaining a permanent and satisfying motivation for learning a foreign language. This is where a talking film can do more than any other medium, considering the time and expense involved. The student is confronted with a change of environment sufficiently forceful to challenge his reactions as if he were suddenly dropped into a foreign backyard and abruptly asked the password for admittance to the club. However, if experiments in the use of prepared dialogue are to have any permanent value, they must be conducted with films that gain the respect of the student audience for technical excellence. A tiresome first experience with this type of activity would seriously affect the possibility of further interest.

Short selections of the dialogue of "Emil and die Detektive" were edited by William Kurath, then of the University of Chicago. As the dialogue was purposely abridged, its preparation before the film was shown could

[8] By Marie Zoe Greene, Department of Education, Art Institute, Chicago.

take anywhere from one class period to two weeks' intensive drill, and yet the cost to each student would remain nominal.

Henry Holt and Company, Inc., published the entire script of "Merlusse" by Marcel Pagnol, noted French playwright and film producer, and edited by Lucius G. Moffatt of Syracuse University. With a long background of teaching in the *lycées* of southern France and in Paris and much literary experience, it has been Pagnol's conviction that film scripts should have as high a literary quality as the written drama and should deserve publication as such. The script of "Merlusse" was first published in France in 1935 in *La Petite Illustration.* The school edition is a reader of 117 pages with illustrations from the film. Because of content and cost a reader of this length is usually apportioned to at least several weeks of work in the student's program.

There is probably need for much experimental research before the satisfactory proportion of written material to film is settled in such a way that the visual and aural elements retain the primary emphasis. Most film distributors however will send dialogue sheets upon request, and from these the individual teacher can prepare her own classroom material. This is especially important when the choice of a film has been based on its cinematic value.

Critics, on the whole, agree that a film is apt to suffer if it is originally conceived from any other than the purely cinematic point of view. Of course, the filmed play has a place of its own in certain programs.

Although the acting of the children is not at all as successful in "Merlusse" as in "Emil and die Detektive" or in "La Maternelle," the atmosphere is accurately rendered. As one British reviewer puts it, "This is a real *lycée*—the hollow corridors, the playground, the dining hall, the classroom, the bare dormitory are absolutely authentic; one is almost aware of the peculiar smell which such places invariably give out." It is to be hoped that the future creation of sound film primarily for language classes will lie rather in the direction of the universal child classic than in any other.

SUGGESTED FILMS (16 mm.)[9]

"La Kermesse Heroique": French dialogue. Recommended for mature classes. International Film Bureau, 59 E. Van Buren St., Chicago.

"La Maternelle." French Motion Picture Corp.

"A Paris," "La Champagne," "Les Canaux," "Shorts." International Film Bureau.

"Merlusse": French dialogue. French Motion Picture Corp., 126 W. 46th St., New York.

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[9] See also O. F. Bond, "Fifty Foreign Films," University of Chicago Press, Chicago.

"Razumov": French dialogue. Story by Conrad. Garrison Film Distributors, Inc., 1600 Broadway, New York.

"Emil and die Detektive." International Film Bureau.

"Singende Jugend": Austrian-made, German dialogue. The Vienna choir boys singing and at play. International Film Bureau.

"Tsar to Lenin": Russian history, 1912–1922. English narrative. International Film Bureau.

"The Wave": Mexican. Photographed by Paul Strand; Spanish dialogue. Garrison Film Distributors.

"Spanish Earth": English narrative. Best of the several films on events in Spain. Garrison Film Distributors.

"The Golem": French and Yiddish dialogue. Not now on 16-mm. stock.

THE MESSIAH [10]

The aims of this lesson are (1) to familiarize the students with the oratorio as a musical form; (2) to explain the various types of voice quality; and (3) to acquaint the students with a few selections from this particular oratorio.

Teacher: Today we are going to study a musical form which developed from the old miracle plays which were used in the church as an aid to teaching the Scriptures. The churchmen first produced this new form of music in a part of the church called the oratory, and from this came the name "oratorio." It is a religious musical piece composed of recitatives and arias alternating with choruses. You recall that a recitative is a sort of nonmelody recitation in declamation style and that an aria is an elaborate melody sung by a single voice. An oratorio is presented as a concert without action or scenery.

Handel was an outstanding composer of oratorios and his *Messiah*, probably his best known, is an oratorio depicting the prophecy, the birth of Christ, the crucifixion, and the resurrection. It has been widely presented by community groups, usually at Christmastime.

The four soloists in this oratorio are a soprano, an alto, a tenor, and a bass. Each of these has several solos, as well as a part in a short quartet selection. First we shall hear an aria sung by a soprano voice. There are various types of soprano voices—the coloratura, a voice which is very flexible, enabling the singer to execute extremely fast and difficult passages; the lyric, which has more depth than the coloratura; the dramatic, which is less flexible but has a deeper tone; and the mezzo-soprano, whose range lies between that of a soprano and an alto. A popular soprano aria from this oratorio is, "I Know That My Redeemer Liveth." Listen carefully and see if you can determine which type of soprano voice sings it. (Teacher plays Victor record 9104.)

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[10] By Geneva Scudder, Gilson, Ill. This lesson constituted a part of the preparation for a trip by the class to a neighboring city where the oratorio was heard in its entirety.

The lowest woman's voice is the contralto or alto, as it is often called. This will be represented by the aria "He Shall Feed His Flock." As you listen, note the difference in the range and quality of this voice and the soprano you just heard. (Plays Victor record 4026.)

The tenor is the highest man's voice. It is this voice which opens the oratorio with a recitative "Every Valley Shall Be Exalted." Note the lightness of this voice and its clear tone. (Plays Victor record 12598.)

The lowest man's voice is the bass. A popular bass number from this oratorio is "Why Do the Nations?" This is an example of a florid aria in which the melody has many decorations. This type of singing was used to the extreme in the Italian opera. (Plays Victor record 9654.)

The outstanding chorus of this oratorio is the final one, the "Hallelujah Chorus." One time in listening to this oratorio the King of England was so carried away by the beauty of this chorus that he rose from his seat. The other members of the audience did likewise. Since that time it is customary for an audience to stand during this number. This chorus is an excellent example of contrapuntal music—music in which we hear two or more tunes interwoven. See if you can hear the various tunes as you listen to this number. (Plays part of Victor record 11825, checks on students' reactions, and then plays record in its entirety.)

Somewhat similar activities covered the other phases of the oratorio, in each of which the students were taught "to listen for something," not merely "to listen." Following the trip, a class discussion was held, and the phonograph was used again several times in clarifying points and emphasizing them.

TYPEWRITING [11]

Increasingly, progressive teachers are relying upon demonstration to replace the wordy explanations which have too often been customary in the past. An important advantage in motion-picture demonstration is that of analysis of technique. If the teacher demonstrator writes at the more rapid rate which is the goal of the beginning typist, her fingers may move too fast for the student to realize how it is being done; if she slows down to a rate that shows the action, she is liable to write as she thinks the technique should be rather than as it actually is. By using slowed-down demonstrations of finished techniques performed at normal rates and under normal conditions, the learner can easily see and analyze for himself the details of correct performance.

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[11] By Eleanor Skimin, Northern High School, Detroit, Mich.: ed., *Business Educational Digest.*

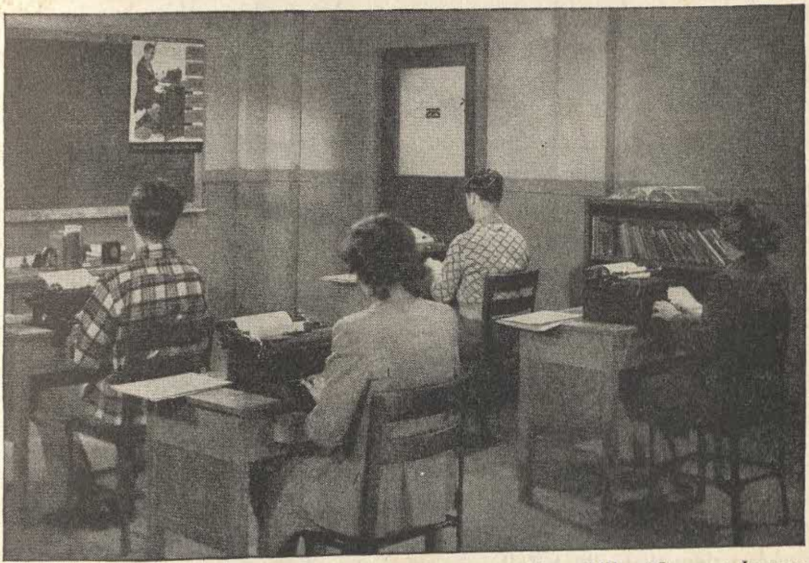

FIG. 9. Seeing proper form helps to make for typewriting skill. (*Coronet Instructional Films.*)

The motion-picture film "Teaching Beginners HOW to Typewrite"[12] is approximately 400 ft. in length and can be shown in about 20 minutes. When it is used for lectures before teacher training classes, the whole film is reviewed at one time. When used for instructional purposes in the classroom, it is advisable to show only parts of it at a time.

Section I of the films shows three "shots": In the first, the secretary prepares to typewrite a letter—correct insertion of paper is shown, and margin and tabular stops are set. Shot 2 shows the typist typing a letter. These facts are evident: (1) the correct sitting position is comfortable; (2) the writer watches her copy; (3) the notebook is in the proper position; (4) the use of the copyholder prevents eyestrain; (5) the paper-release lever is used to release the paper. Shot 3 shows the letter completed.

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[12] By Eleanor Skimin, produced at State College of Washington, Pullman, Wash.

Section II boldly shows "How not to do it." This shot is in direct contrast to the preceding one. In addition to the general instability of the execution, there are many things about it which the students will easily recognize, such as the poor sitting position, the notebook on the wrong side of the machine, the lack of smoothness and rhythm in the writing, the time wasted by the excessive movements of the hand and arm, and the lack of confidence and control. While it is generally considered bad psychology to show the wrong way to do anything, this shot in direct contrast to the first emphasizes the right way and is therefore really functional.

Section III shows the beginner the details of correct stroking. Arched fingers, quiet arms, and individual finger stroking are illustrated very clearly. The stroking of whole words as one stroking pattern with complete relaxation after each word is properly illustrated and demonstrated.

Section IV analyzes the technique of proper shifting for capital letter, carriage returns, and correct hand positions. Students can readily note the ease with which the shift key is used and the fact that it is a hand and not an arm operation. Points of technique are perfectly demonstrated: stroking is quick, sharp, and resilient; wrists are kept steady; hands are not rigid but relaxed, and they stay close to the basic position.

All or part of this may be shown according to the lesson to be presented. A complete showing of the film from time to time is advisable in order to maintain interest in the development of good habits. The motivation that comes from the showing of a motion-picture film is apparently much greater than that which follows any teacher demonstration or lecture. To be sure, the teacher must be there to direct the class in correct interpretations.

An Illustrative Lesson with the Aid of the Motion Picture

The first day's lesson in using the shift key and the writing of the sentence

"They were trying their best."

Our work today consists of learning how to make capital letters properly. I am going to show you a motion-picture film of a very good typist performing this operation, just as you will do it.

As the hands in the picture are very much enlarged, you can see exactly how the typist used them to do good work with such complete ease, control, and rhythm. The first exercise is repeated several times for you to get a clear picture as to just how the fingers move. The fingers in the picture are stroking the letter *j* four times, then the little finger of the left hand merely reaches over to the shift key, holds it down with a mild degree of force while the letter *j* is struck again (this causes the type to make a capital letter), the left hand returns to its basic position immediately after this stroke is completed, and just as this operation is completed, the right strokes another *j*. This is what is written: jjjjJj jjjjJj jjjjJj.

Now that you have seen this done we will attempt to do likewise. Hands in position and when I say *j* four times, shift *j*, *j* pause, you will try it. Now I'll turn out the lights and show the picture; try the operation while the room is dark, for typing is done by "feel." After we can take care of the letter *j*, we will try the same procedure with *f* and *t*. This time we will use the little finger of the right hand to hold the shift key.

You have noticed that the holding of the shift key is done with the little finger and that it must be held all the way down while the letter is being struck. You have noticed, too, after the shift operation that the hand returns immediately to its basic position.

Now, will you observe the writing of the word "they." This is a word that appears often in all writing, and one that lends itself to smooth and rhythmic typing. Please notice the hands in the picture. They seem to anticipate the whole word before it is written. The slow motion will show you just how the fingers reach for the keys. In the sentence for today there are three flash words, "they," "were," and "their." The word "trying" has the common ending "ing" on which you have worked before. The hands in the picture show you HOW to write this sentence. Your own careful practice will enable you to do it very well. We shall continue with the practice of this sentence tomorrow, but without the film. Try to remember all these fine points of technique because we will have a short discussion of them at the beginning of the class.

UNDERSTANDING THE ATOMIC AGE [13]

The world's leading scientists were not too surprised when the atomic bomb with its tremendous release of energy became a reality. However, most of our adults as well as our boys and girls were awestricken and bewildered, and many are yet. The large majority of the world's citizens were not ushered into the Atomic Age; they were "exploded" into it. When something of this sort occurs, people are likely to adopt one of two general points of view: a few will show interest, sense the magnitude and importance of the situation, and will attempt to understand; a great many more will shrug their shoulders, admit that it is far beyond their comprehension, and either put such scientific advancement in the realm of the supernatural or resignedly hope that there are others who can and will take care of all of us.

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[13] By John A. Aitchison, Senior High School, Galesburg, Ill.

The impact of the discovery of atomic energy is of such magnitude in practically all of our diverse activities that citizens living in a democracy where each individual can vote and influence public opinion should have some fundamental knowledge of a scientific discovery of such import. An eminent scientist recently said, "The Atomic Bomb is here to stay, are we?" Obviously, the school must do its best to help boys and girls to understand and, in understanding, be better able to adjust themselves to living in the Atomic Age. The following plan is built around the film "Atomic Energy." [14]

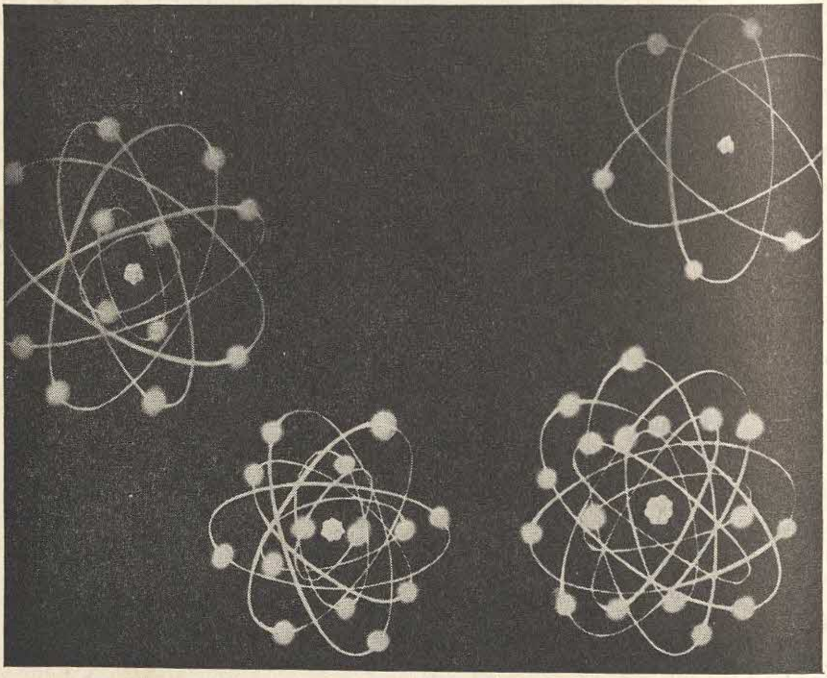

FIG. 10. Graphic animation and simplified commentary help to explain concepts difficult of comprehension. (*Encyclopaedia Britannica Films Inc.*)

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[14] Produced and distributed by Encyclopaedia Britannica Films Inc., Wilmette, Ill. This is an excellent one-reel sound movie that should be a real aid to an understanding of atomic energy. The included material is of good sequence, authentic, complete, and attractively presented, the graphic animations are very clear, and the narration is pertinent and coherent. The two fundamental and otherwise difficult concepts—the true nature of chemical energy and how energy is obtained from nuclear changes—are exceptionally well explained by means of animated drawings and the accompanying narration.

I use this film in physics, but it is just as well suited for use in chemistry, because senior high school boys and girls, if given the correct preparation, can readily understand the material presented. I use it in the last part of the last unit in the physics course because science students by then have a sufficient background to achieve a thorough understanding of the material. It is a good review and serves as a fitting climax to a study of energy.

ELECTRONICS AND ATOMIC ENERGY[15]

Desired outcomes: An understanding and appreciation of

1. The mass-energy relationship of atomic parts
2. Synthesis and how the sun releases energy
3. Chemical energy and nuclear and their importance
4. The tremendous influence of atomic energy on society
5. Atomic structure and its importance
6. Radiant energy and its importance
7. The work of scientists and the importance of applied science in our everyday life
8. Photosynthesis

Procedure: Preview can be given as group reports or by the instructor.

1. Scientific progress is a result of the cooperative and continuous work of many scientists in many countries. The following were especially interested in atomic energy and in knowing if this energy could be released to do work.
    - *a.* Becquerel, the existence of radioactivity
    - *b.* Pierre and Marie Curie, discovery of radium, radioactivity
    - *c.* Rutherford, alpha, beta, and gamma rays
    - *d.* Einstein, mathematical formula, importance of mathematics
    - *e.* Prominent American scientists, methods used in breaking down atoms
    - *f.* Hahn, Meitner, and Frisch, splitting uranium atom
    - *g.* Bohr's contribution
    - *h.* Fermi and the creation of a new element
2. The modern conception of the atom.
3. Isotopes.
4. The importance of a chain reaction.
5. The development and the effect of the atomic bomb.
6. Probable uses of atomic energy.

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[15] The students have studied already about the molecular theory of matter and atomic structure. They have an understanding of the general structure of the atom, the nucleus, neutrons, protons, and electrons. An understanding of energy and the transformation of energy is one of the major objectives of the course, having been studied and emphasized in each unit.

Vocabulary:

Review Words

energy level
molecule
atom
proton
electron orbit
nucleus
radiation
radiant energy
photosynthesis
explosion
radioactive

New Words

positron
nuclear energy
alpha, beta, gamma, radiation
atomic number
isotope
nuclear fission
nuclear synthesis
transmutation
chain reaction
critical mass
moderator
electronic energy
atomic energy

Questions: Discuss these questions in order that the pupils understand them and know what they are supposed to be looking for in the film. The illustrative comments reflect diagrams from the film.

1. Are atoms found in all matter?
2. Which atom is the simplest one found in nature?
3. What two particles are found in the simplest atom? Are they of the same weight? If not, which one is heavier?

   When hydrogen atoms combine to form a helium atom, a certain mass of weight is loosed, as shown in this diagram from the Encyclopaedia Britannica Film, "Atomic Energy." This loss is radiant energy. It is the process which goes on in the sun, whereby 5,000,000 tons of mass are burned up every second.
4. How is it possible for four hydrogen atoms to form one helium atom? What change in weight is noticed? Is energy liberated or absorbed?
5. Is it possible for matter to change to energy?
6. Each of the hydrogen atoms has one electron; the helium atom has two electrons in its orbits. What happens to the other two electrons from the four hydrogen atoms?
7. What is the source of the sun's energy? Is the sun losing weight?
8. What is the difference between chemical energy and nuclear energy?
9. What causes the difference in energy levels in photosynthesis and in combustion?

10. What types of rays are emitted during radioactivity? How was each shown on the screen? What does the radium finally become?

    Compacted atoms have many electrons and protons, as shown here. Atoms range from the simple hydrogen atom to the complex uranium atom, used in the first atomic bombs.

11. Do the number of electrons and protons vary in atoms of different materials?
12. What is the most complex atom found in nature?

    Here a uranium nucleus is being bombarded by a neutron.

13. What is nuclear fission? How is it sometimes accomplished?
14. How many mass-units are lost in nuclear fission of uranium? What happens to the mass lost?

    One free neutron which has split the nucleus of one uranium atom has released additional neutrons which are in process of splitting every uranium atom in the field. Even where billions of uranium atoms are involved, the entire chain reaction requires less than a millionth of a second.

15. What is a chain reaction? Is such a reaction rapid or slow in the case of uranium atoms?
16. Why does the atomic bomb produce such a violent explosion?
17. What is the main difference between synthesis and fission?

First screening of the movie: Show it through without comment.

Class discussion and reports: Clarify hazy concepts, discuss the questions and vocabulary from the above study list.

Second screening and discussion: See if the subject has been well understood. Make an application of its concepts.

Follow-up test:

1. By means of a simple diagram, show the two particles found in the simplest atom.
2. Which part of the simplest atom has the most weight? About how many times more than the other part?
3. With the aid of diagrams, show how four hydrogen atoms can form one helium atom. What happens to the loss of weight? What do scientists call such a reaction? Is this reaction an important source of energy?
4. Explain the difference between chemical energy and nuclear energy.
5. Explain the energy transference in photosynthesis and in combustion.
6. What causes energy to be released during radioactivity?
7. Explain what is meant by nuclear fission.
8. With the aid of diagrams, explain what we mean by a chain reaction.

9. What is the difference between synthesis and nuclear fission?
10. What causes an atomic bomb to produce such a violent explosion?

Reading references:

The Atomic Future, Howard W. Blackeslee, and Associated Press Supplement, *Chicago Sun,* May 3, 1946.

"Scientists against Time," James, Phinney, and Baxter, pp. 419–447.

"Chemistry for Our Times," Weaver and Foster, pp. 179–196.

"Basic Chemistry," Bayles and Mills, pp. 235–252.

GERMINATION AND GROWTH OF PLANTS[16]

General Assignment:

1. Study pages 115 to 133 of the text (Hunter, "Problems in Biology"). This material will be supplemented by lectures, discussions, demonstrations, experiments, slides, and motion pictures.
2. Complete the exercises as directed in the workbook.
3. Organize the material by constructing a summary outline of the unit's work.

Presentation: The main purpose of this unit of study is to show how a baby plant, or embryo, grows into an adult. Seeds, as we learned in a previous unit, are formed in fruits as the result of the pollination of flowers. Seeds may, for long periods of time, remain dormant, then suddenly show signs of life. This activity is due to a stimulus of some kind. Obviously, some conditions both inside and outside the seed start the growth of the plant. We are, then, interested in finding out just what these conditions that start and maintain growth are. By experimentation we shall find the answer to this problem. Then, too, plants must obtain food in order to grow. The fact that seeds do contain food materials of various sorts is evident when we think that we eat such seeds as peas and beans. We shall then make a comparison of the manner in which foods are used by plants with the way in which we use the same substances.

Assimilative Material: Among the problems to be solved in this unit are the following:

A. Where are embryo plants found?
  1. The study of seeds
    a. Firsthand study of bean and corn seed

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[16] By C. J. Koenig, Scarborough School, Scarborough-on-Hudson, New York.

  - *b.* Keystone Biology Lantern Slides
    - 6–Seed Coats 8–Embryo of Corn and Bean

B. How can we find what nutrients are present in seeds?

- 1. Test for starch
  - *a.* Microscope study of crushed bean seed stained with iodine
  - *b.* Study of colored chart of starch test
- 2. Test for proteins:
  - *a.* Test carried out by each student
  - *b.* Grease spot on paper projected to show it is translucent. Study of Langworthy Food Charts 6, 10, 13, 14, showing by visual means percentages of starch, proteins, and fats in various seeds

C. What factors are necessary for germination?

- 1. Water: Demonstration showing failure of dry seed to grow in dry moss, and successful growth of soaked seeds in moist moss
- 2. Air: Demonstration showing failure of seeds to grow when in a vacuum, and successful growth of seed in container open to air
- 3. Temperature: Demonstration showing failure of seeds to grow when kept in warm oven or in refrigerator, and successful growth when kept at room temperature

D. How does the embryo become a plant?

- 1. Cotyledon; 2. Plumule; 3. Hypocotyl
  - *a.* Observation and study of bean and corn seedlings at various stages of growth in a germinating box
  - *b.* Study of preserved specimens showing progressive stages of growth of seedlings
  - *c.* Detailed study of film "Do You Know Beans?"[17] showing animated drawings and progressive shots of bean growth
  - *d.* Study of lantern slides showing structure of parts in various seeds. Keystone slides, 8–Development of Corn and Bean, 9*A*–Development of Corn Seedling
  - *e.* Microscopic study of sections of corn seed
  - *f.* Experiments on effect of removal of cotyledon on growth

E. What makes a young plant grow?

- 1. Proof that oxidation occurs in plants:
  - *a.* Experiments: Testing air in flask containing growing seeds indicating increased quantity of carbon as shown by limewater test
  - *b.* Demonstration: Expelling air from the lungs through limewater to show pressure of carbon dioxide in human breath

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[17] Edited Pictures System, Inc., 330 West 42nd St., New York.

F. Do plants digest food?

1. Proof that starch is changed to sugar in plants
   - *a.* Test with Fehling's solution to show evidence of grape sugar
   - *b.* Demonstration: Test dry, unsprouted bean or corn seed for grape sugar
   - *c.* Demonstration: Test dry, sprouted bean or corn seed for grape sugar
   - *d.* Demonstration: Test sprouting bean or corn seed for starch; study specimen under microscope for presence of starch grains
   - *e.* Demonstration: Digestion of starch to sugar in test tube by use of diastase
   - *f.* Demonstration: Test piece of cracker for grape sugar before and after chewing in the mouth

The charts and slides are always accessible to the students and in the review of the unit they often independently make use of them to supplement or replace rereading of the text material.

Checkup: At the completion of the unit an oral and written checkup is given.

Some of the slides and charts used in the study of the unit are made, or were made, by the students themselves during the assimilative period. This offers a combination of visual and manual expression which is very stimulating to the students gifted in those lines. Too, this opportunity helps to build up a permanent library which is of use to the other students.

COMMUNITY HEALTH PROBLEMS [18]

In order to make the science classroom a real preparation for successful life in a democracy, the *H*9 science classes are organized as "cities" with elected officers. Each "city" has a mayor, city council, chief of police, city clerk, prosecuting attorney, defense attorney, city printers, judges, city librarians, and even a street superintendent. The student officers take over class discipline, leaving the teacher free to teach, and classwork is arranged in units called "contracts," which make use of the city organization.

1. Films:

Bacteria (Silent. 12 min.)
Beneficent Reprobate (Sound. 40 min.)
Conservation of National Resources (Sound. 10 min.)
Defending the City's Health (Sound. 10 min.)

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[18] By Dorothy F. Osburn, Westlake Junior High School, Oakland, Calif.

East Bay Water Supply (Sound. 23 min.)
Purifying Water (Silent. 12 min.)
Sewage Disposal (Silent. 12 min.)
This is T.B. (Sound. 10 min.)
Water Cycle (Silent. 12 min.)
Water Supply (Silent. 12 min.)

2. ***Outside speaker:*** The East Bay Municipal Utility District provides a speaker who comes to the classroom, bringing sound equipment and an interesting sound film in color, "At the Turn of the Faucet." The film describes the source, storage, purification, distribution, and use of our local East Bay water supply.

   Invitations and "thank you" notes to speakers are written by the City Clerk on "dittoed" stationery which gives the name of the city and the names of the city officers.

3. ***Room library to supplement text material:*** Booklets prepared by the East Bay Municipal Utility District are available. These show pictures and diagrams of all phases of our water supply from the Mokelumne River to the schoolroom faucet.

   "Know Your Watersheds," a U.S. Department of Agriculture Forest Service pamphlet (AIS 67), published February, 1948, and "You Burn Me Up!" published by American Forest Products Industries, Inc., emphasize the value and necessity of adequate protection for watersheds and forests.

   Booklets from the Metropolitan Life Insurance Company cover the subject of water-borne diseases, diseases carried by mosquitoes, and so on.

4. ***Bulletin board:*** Throughout the term we maintain a small 10 by 14 in. wooden bulletin board with grooves for two slips of paper to slide in. Each day a different question is posted along with the answer to the preceding day's question. Students who wish may hand in their answer to the question, and if correct, they receive a tally. Five tallies become an A. If only one student turns in the correct answer on any day, he receives an A without waiting for five tallies. This discourages exchange of information between students.

   We also have a "Who or What Is It?" bulletin board on which pictures of persons, places, processes, or products are displayed. A different picture is posted daily, and students may turn in their answers. Tallies are handled as for the question board.

   We have cut out and assembled, in an alphabetical file, several sizes of corrugated-cardboard block letters. These are used to make attractive headings for our large bulletin board displays. These displays are changed to fit the contracts currently under study. We collect pictures from all possible sources and file them under the contract headings where they may prove useful.

Cartoons are often assigned and the best of these, judged from the ideas conveyed, are displayed.

5. ***Handmade slides:*** We use handmade, frosted glass slides to illustrate oral talks given by the students or to make clear certain points which the instructor wishes to make clear.

Tests are often typed on cellophane, made into slides, and projected. These prove excellent when the element of time is important in giving a test.

Colored pictures, taken either by teacher or by students, and made into 2″ x 2″ slides, are sometimes projected. These may illustrate dams, watersheds, lakes, rivers, and so on.

6. ***Microscopic work:*** We use both the microscope and the microprojector to show algae, one-celled water organisms, salt crystals, and so on.
7. ***Contracts:*** The form which the contract takes varies from time to time, never being used a second time. The following contract is fairly typical:

*H*9 CONTRACT COMMUNITY HEALTH PROBLEMS SPRING, 1948

In this contract you are to assume that you are a citizen in a real city and that you are to take an active part in its activities and in solving its problems.

You are to go as far in the assignments as YOU can. Do not wait for anyone else. Hand in the assignments as fast as they are completed.

I. Problems of water supply

A. Sources

1. Your city must secure an abundant supply of water. List all the ways in which water is used in a modern home. Have you any idea how much water must be provided per capita in a city such as Oakland? Find out if you can. Conduct an investigation of the usual sources of water for a large city and prepare a written report for the City Council, listing possible sources and the advantages and disadvantages of each source. (Turn it in for grading.)
2. The rural community nearby also has a water supply problem. The average farm can get its water from (*a*) cisterns, (*b*) springs, (*c*) shallow wells, or (*d*) deep wells. Prepare a report for the local paper, showing the dangers and the advantages of each possible source. (Hand the report in for grading.)

3. See the motion picture, "At the Turn of the Faucet," shown by the representative of the East Bay Municipal Utility District, and then prepare either an editorial or a cartoon for the editorial page, pointing out the necessity for having pure water for every citizen. (Hand it in for grading and posting on the City Bulletin Board.)
4. You are to work in the office of the City Health Department. The City Health Officer will explain that there may be three types of impurities in water: (*a*) dissolved material, (*b*) suspended material, and (*c*) organic matter. Give examples of and explain the meaning of each of these impurities. What is an epidemic? What are the diseases that often occur as epidemics? Could impure water ever be the cause of any of them?

   Watch a chemist analyze a sample of water for suspended matter, dissolved matter, and organic matter, and also to see if the water is acid, base, or neutral in reaction, whether it contains salt, and whether the water is hard or soft.

   Then analyze the *unknown* sample which is given to you to analyze and make a complete written report on its contents. Be sure to give the number of the sample you analyze.
5. A member of the City Council objects to the cost of purification of the city's water, saying that if water is clear and tastes good, it is good enough to use. As a representative of the City Health Department you must accept or disprove his statement. What would you do and how would you do it? (Hand in your solution for grading.)
6. The Civic City Club has asked you to speak on the subject, "The How and Why of Water Purification." Write out an outline or summary of what you plan to say, including diagrams you intend to use on slides for projection.

II. Enemies of good health

A. *Narcotics*

1. Certain substances are called narcotics. Make a list of the main ones. Since alcohol is the narcotic most widely used, read several scientific references to find out all you can about its effect on the human body. Include Miss Osburn's article, "Outlines of Lessons in Alcohol Education," in your reading. How does alcohol affect sight? Hearing? Mental reaction time? Judgment? Driving ability? *Why does it have these effects?* How many people are killed in traffic accidents in the United States in an

average year? How much of this is attributed to drinking drivers and pedestrians? What effect does alcohol have on the white corpuscles in the blood? Would this contribute to disease? What is alcoholism, and is it considered to be a disease? How many alcoholics are there now in the United States? Is there any known cure?

A high school student writes you a letter asking your advice concerning the use of alcohol. Answer the letter, stating your scientific reasons either for or against the use of alcohol as a beverage. (Hand in your letter for grading.)

What other narcotics are enemies of good health? Why are they enemies? Prepare a cartoon illustrating the effect of the use of narcotics on health and safety, either from a personal, community, or national point of view. The idea, not the artistic effect, is what counts. The three best cartoons will be displayed on the school bulletin board. (Hand your cartoon in for grading.)

B. Diseases

1. Diseases are still a problem, in spite of great medical and other scientific discoveries. There are two great classes of disease, (*a*) those caused by living microscopic organisms such as germs and viruses and (*b*) those caused by the lack of some essential substance in the diet. The latter are called "deficiency diseases." There are still others, like cancer, for which the cause is still unknown.

   Find out about the kinds of germs, the shapes of bacteria, and the meaning of "virus." What four conditions are ideal for the growth of bacteria? Would the removal of one or more of these conditions retard their growth? Are all bacteria harmful? How are germs usually spread? What do we mean by a disease being "contagious"? As a member of the staff of the Health Department prepare some good rules by which we can help to avoid the spread of contagious diseases. (Hand your list in for grading.)

2. Some diseases have been conquered. It is possible to build up resistance to certain diseases, as in the use of vaccination to avoid smallpox and the use of iodine to prevent goiter. Still others are unsolved mysteries.

   Prepare a short magazine article entitled What Science Has Done to Conquer Disease. Include the main facts about the fight against smallpox, yellow fever, malaria, diphtheria, tuberculosis, and so on. (Hand it in for grading.)

What diseases are still unconquered? If you could have your wish, what unsolved scientific health problem would YOU help solve? Why?

3. Find out all you can about "deficiency diseases." What are the main known vitamins, what disease does each prevent, and what are some good sources of each vitamin? Prepare a chart, illustrated if possible, showing the main facts about vitamins and why they are essential. The chart is for use in the school cafeteria. (Hand your chart in for grading.)

   What are the classes of food which should be included in our daily diet if we are to build and maintain strong healthy bodies? Prepare a set of food rules for the use of the athletic coach in setting the training table for his team. (Hand in your food rules for grading.)

III. *Waste disposal*

A. Garbage and sewage

1. In order to have the city maintain good health conditions, it is necessary to get rid of waste products in such a way as to protect both itself and its neighbors. Prepare a report for the general science class showing the dangers of contamination of food by flies, rats, mice, and cockroaches through improper garbage disposal. Draw a cartoon for use on a slide showing the "Journeys of a Fly." (Hand in both assignments for grading.)
2. We may dispose of our city's sewage by emptying it into a nearby (*a*) ocean, (*b*) bay, (*c*) lake, (*d*) river or (*e*) passing it through a modern sewage disposal plant. Investigate each possibility and report your recommendation to the City Council. (Hand in your recommendation for grading.)
3. The rural community asks for information concerning the proper construction of septic tanks. Prepare and submit a diagram (for a slide). (Hand in your diagram for grading.)

IV. *Need for united action in solving community health problems*

General conclusions from the contract: Why are the health problems of both city and rural areas closely connected? Can one be well without the other? What if one state contaminates the water of a river which another state uses for a water supply? What if a person suffering from a contagious disease travels by automobile from one state to another? What if one country requires pasteurization of milk and another does not? Why are state and national health controls necessary? Do germs respect national boundaries?

Prepare either an editorial or a cartoon for the editorial page showing how the welfare of one depends on the welfare of all. Make this your best work. (Hand it in for grading.)

USING THE MICROPROJECTOR IN PHYSICS AND CHEMISTRY [19]

The four main advantages of using the microprojector in high-school science classes are (1) it is relatively inexpensive because a single group-used projector replaces a number of individually used microscopes; (2) it presents a greatly enlarged picture of the specimen, object, or action; (3) it can be competently operated by the teacher; a great deal of student use of the microscope is inexpert to say the least; and (4) it provides opportunity for a very pointed, intriguing, and profitable teaching technique. The following are a few of the phenomena which can be presented by the microprojector:

1. Stress and strain on fibers, filaments, and surfaces.
2. Surface-tension phenomena with films on aqueous and other solutions.

   With the use of hanging drop slides and special slides made with a well in the center, soap solutions and oil films of varying viscosity are strikingly projected under low-power magnification as well as high power. Dropping dispersing agents on the surface while in projection also shows the breakdown on the surface films. Such surface action, as the peculiar rotation of salicylic acid crystals, provides problem material for the capable student.
3. Brownian movement observation with high-power oil-immersion projection.
4. Physical examination of wool, cotton, silk, rayon, linen, or other textile fibers.

   By lightly staining in carmine, eosine, or other dyes and use of balsam with cover glasses, permanent slides for projection may be made which give excellent results in identification of fibers. Effects of various solutions on fabrics may also be shown as well as laundering effects with soap and detergents. With use of cross-haired slide or objective, the thread count of fabric samples can be made as projected.
5. Gross projection of prepared slides showing fingerprints or other print materials which permit light transmission.

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[19] By Theodore Sargent, Swampscott, Mass.

Canal patterns of fingerprints project very well. Further application can be made in blood smears and similar investigations which suggest themselves in biological or physiological or pathological examination.

6. Migration of charged particles in solutions.

   By constructing a special slide with rectangular well and platinum electrodes connected to a polarized circuit, the migration of charged particles in electrolytes is strikingly shown. By this technique the electric character of charged particles is clear to the student. Use a reversing switch to show changes of migration while being projected, and the results are dramatic in effect. Colloidal solutions are particularly well adapted to this work, and the student easily grasps the significance of ionic charge and migration.

7. Interference patterns of light.
8. The optical principles of image and object relationship.
9. The optical principles of refracted light and color sense.
10. The gross examination of properties of crystals and other small forms of matter.

    With white and polarized light, properties such as opacity, solubility, and refraction of minerals, textiles, ceramics, tissues, foods, paper, petroleum, rubber, paints, liquid specimens, crystals, and many common compounds can be studied if thin layers of material are selected. Starch grains show a dark cross that rotates as the analyzer is turned. This is a standard test for starch in botanical materials.

11. The projection of crystal growths in solutions.

    Some suitable and interesting growth patterns are shown in the crystallization of ammonium chloride; sulfur in carbon bisulfide; sodium nitrate; copper sulfate; sodium chloride; potassium dichromate; sodium hyposulfite; potassium chlorate. It is important to show melting under the effects of the heat of the arc beam by moving the cooling cell out of the light path and to show subsequent crystallization without changing the field of projection.

12. The growth of crystals in dark-field projection and with polarized light.
13. The Tyndall phenomena in colloidal solutions.
14. All material now available on microscope-prepared slides can be projected in the microprojector.

    The caution should be made, however, that the beam is cooled to the degree necessary to prevent damage to the material mounted on the slide.

15. Dark-field and opaque projection offers some opportunity.

SO YOU WANT TO BE A TEACHER? [20]

The preceding lessons in this chapter were written for use with a specific class. This plan has been developed to show how the motion-picture film can be used as a part of the guidance program. Preferably, the group should be limited to thirty or thirty-five students.

I. Preparatory activities

1. *Organizing the group.* The students in the group should be divided according to the field in which they wish to prepare—primary, intermediate, and upper grade work, as well as the various high school departments. Those interested in the same area can work together in collecting information and in making interviews.
2. *Planning the interview.* Students can obtain a wealth of information from interviewing teachers in their own or nearby systems. Naturally, the interview should be well planned, based upon a definite list of questions.
3. *Arranging for the demonstrations.* Arranging for the members of the group to observe the teacher at work in the classroom is as logical as scheduling similar opportunities for observational activities in any vocational field. Such a setting is natural because it concerns actual elements of a teaching situation—room, equipment, pupils, teacher, and tasks.
4. *Securing materials.* After each group has been organized, certain members may be appointed to write for pertinent materials. For example, they may write to teacher training institutions for catalogues and other descriptive materials; the state accrediting agencies for information on specific requirements for certification; and the Future Teachers Association for relevant materials.

II. Objectives of the lesson on the film "Teaching" [21]

1. To give the students a better understanding and appreciation of the teaching profession
2. To acquaint them with the services the teacher renders to society
3. To show that the teacher influences the lives and thinking of all pupils
4. To show that teaching offers many rewards other than monetary

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[20] By Alvin B. Roberts, Western Illinois State College, Macomb, Ill.

[21] Vocational Guidance Films, Inc., Des Moines, Ia.

5. To acquaint the students with the many fields in which the teacher may specialize
6. To show them the type of training needed in the various fields
7. To enable the students to see that the teacher really "makes the school"

III. Screening the film: Immediately preceding the viewing of the film, the students should review briefly the chief points that have been brought out through their preparatory work. Then the teacher or some student should lead the group in listing specific information which they wish to obtain from the film. The following is a suggestive list of appropriate questions:

FIG. 11. "Come and meet your new friends. I am sure you will like them." (*Vocational Guidance Films, Inc.*)

1. In which way have teachers improved the standard of living for the nation as a whole?
2. What personal qualities must the teacher possess?
3. What are the different areas for which the teacher may prepare?
4. To what extent is there a demand for special teachers?
5. Is the teaching profession overcrowded?
6. What are some of the advantages of the teaching profession?

7. How may the teacher use his vacation?
8. Does your state provide minimum salary? Tenure? A pension system?
9. Are teaching requirements the same in all states?
10. What areas in teaching offer the best opportunities for men? For women?

After showing the film and discussing the pertinent points, new questions undoubtedly will be raised. These questions may be listed and used as a motive for a second screening of the film. They may also be used as a springboard for follow-up activities.

IV. Follow-up activities

1. After seeing the film and discussing it, the students can refer to the materials previously collected for more information pertaining to their particular fields of interest.

   An interesting activity is to have the students check the specific requirements for certification in the fields of their choice. The advantages of preparing to teach in two or three related fields should be pointed out.

2. Representatives of the various teacher training institutions should be invited to talk with the group. Previous to his talk each speaker should be given a list of questions or specific topics suggested by the group.

   If representatives of several teacher training institutions are present at the same time, they may work together as a panel. Careful preparation and well-formulated questions will keep the panel moving and add "snap" and interest to the discussion.

3. Visits should be planned to the various colleges or universities for firsthand contacts with the teachers in specific instructional areas.

PLANNING A FIELD TRIP [22]

A successful field trip requires a great deal of preparation and planning as well as intelligent follow-up activities. Following are the materials used by Galesburg High School in planning and executing a field trip for American history students to the Lincoln country of New Salem and Springfield. This material is arranged in five parts and is used in the order indicated.

I. Instructions to parents and guardians: In order to justify the trip, explain the general details, and secure proper permission for the students to participate, the following letter was sent to the parents and guardians of the students who planned to participate.

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[22] By John H. Griffith, Galesburg, Ill.

To Parents and Guardians of Galesburg Senior High Students

The Social Studies Department of Galesburg Senior High School is considering the possibility of organizing a field-study trip to Springfield, New Salem State Park, and the Indian Burial Mounds at Lewistown. The tentative date set for the excursion is ______. The trip is open to juniors and seniors taking American history. Preference will be given seniors if more students register than can be taken.

Such a trip would be of particular interest and value to our American history and American literature classes. The students electing the trip would carefully study in advance the places to be visited, in order that the maximum value could be derived from the experience. In addition, project credit in history and English will be allowed if those who go prepare an acceptable written report of the day or participate in a round-table discussion on the trip before their class group upon their return. The Lincoln shrines and Centennial Museum in Springfield, our incomparable frontier village at New Salem, the Ann Rutledge grave at Petersburg, and the Indian Burial Mounds would vitalize much of our year's work. Two instructors will accompany each bus and provide close supervision throughout the day. Advance arrangements will be made with state Capitol and state park officials to guarantee adequate guide service.

Tentative plans call for a long day's absence from Galesburg: 5:30 A.M. to 9:30 P.M. This trip would be made in chartered busses. The drivers are highly competent, and adequate liability insurance is carried. The total cost of the trip should not exceed _____ per student and would include: transportation, entrance fees, and a substantial meal at the Wagon Wheel Inn at New Salem before the return trip is begun. The only essential item not included will be the noon lunch. This may be carried individually or purchased in Springfield.

If you approve of your son or daughter taking this study-trip with us, please sign and return the accompanying blank. If a sufficient number are approved, we shall feel justified in going on with more definite plans. Please do not feel that this trip is necessary or essential for your child's success in class work. Other projects of exactly equal weight are open to those who of necessity will be unable to make the trip.

Sincerely yours,
Department of Social Studies
Galesburg Senior High School

I hereby give my consent for my son or daughter ______ to take the Springfield study-trip as outlined.

Sign____________________

Date____________________

II. **Directions to students:** The following directions were mimeographed and a copy given to each student. Appropriate discussions of each topic were held as a part of the preparatory procedure.

A. General directions.

1. Sets of pamphlets may be secured from your classrooms. Call for these, read, and return them promptly in order that they may be passed on to others. A study of these will add greatly to your understanding and pleasure of the trip. Trace our route on the highway maps. The following materials are available (illustrated descriptive pamphlets *a* to *e* are published by the state of Illinois):
   - *a.* "The Abraham Lincoln Home"
   - *b.* "The Lincoln Tomb"
   - *c.* "New Salem State Park"
   - *d.* "Guidebook to Illinois State Buildings"
   - *e.* "Springfield, Illinois"
   - *f.* "Quick Facts about Springfield" (Chamber of Commerce)
   - *g.* "Illinois Highway Maps"
   - *h.* "The Dickson Burial Mounds" (Dr. Don Dickson)
   - *i.* "Burial Grounds of the Stone Age" (Article on Dickson and other mounds in Illinois Valley in *Travel* magazine for December, 1939)
   - *j.* "Illinois," Federal Writers' Project
   - *k.* Illinois Blue Book, 1930–1940 and 1943–1944
     (Many of these are in Lower Hall on bulletin board)
   - *l.* "Mentor Graham–The Man Who Taught Lincoln"
   - *m.* "The Illinois" (Rivers of America Series)
   - *n.* "Abraham Lincoln Grows Up" (Carl Sandburg)
     (In addition to these references, see the special table in the library containing other relevant materials)
2. Wear comfortable clothing, not too good, suitable to the prevailing weather. This applies to shoes particularly.
3. Carry a small pocket-size notebook and a loaded automatic pencil for recording your impressions.
4. If you have a camera, you can make good use of it during the day. We will take movies of the trip this year.

5. The success of our trip will depend largely upon its running strictly on the time schedule outlined below. Be on hand everywhere at the appointed time.
6. Although we shall be far from home, we shall be reflecting "something or other" upon Galesburg and our High School. Let's avoid excessive boisterousness in public places. Let's display courtesy to guides, waitresses, and others with whom we come in contact. When making arrangements at the parks, museums, and restaurants for the resumption of these trips after a four-year suspension during the war, everyone contacted was happy to have us return. Without exception they recalled our previous visits as having brought a superior high school group—folks they were glad to have as guests.
7. Everyone should carry along some money for lunch, post cards, souvenirs, or possible emergencies. Leave no valuables in the busses.
8. Bear in mind at all times that we are making this trip primarily for the purpose of learning. We should have a fine time too, but let us try to keep the major purpose first. If you desire project credit in your social science class, you will be expected to write a good report of the day or to participate in a group discussion before your class. There are many topics for individual investigation afforded by the trip, such as various aspects of Lincoln's life, the Indian Burial Mounds of Illinois, Fulton County Strip Mining, Edgar Lee Masters' "Spoon River Anthology," Vachel Lindsay's poetry, and Springfield, the Lincoln Tomb Plot, the Lincoln Memorial Highway, Illinois' State Highways, Illinois' State Capital, and so on. See your teachers if you should like to work on one of these.

B. Time schedule for Springfield field trip

6:00 A.M.	Leave high school, Galesburg
7:30 A.M.	Arrive Dickson Mounds
8:15 A.M.	Leave Dickson Mounds
9:45 A.M.	Arrive State House, Springfield
12:45 P.M.	Leave State House for Lincoln home
1:00 P.M.	Arrive Lincoln home
1:20 P.M.	Leave Lincoln home for Lincoln tomb
2:20 P.M.	Leave Springfield for New Salem
2:55 P.M.	Arrive New Salem
6:30 P.M.	Leave New Salem

6:45 P.M. Arrive Ann Rutledge grave, Petersburg
7:00 P.M. Leave Petersburg
9:30 P.M. Arrive Galesburg

C. Orders of the day for Springfield field trip

4:45 A.M. (No later) B-r-r-r. Get up at the command of a trusty alarm clock. Incidentally you should have been sound asleep at 9:00 P.M. Friday. Dress appropriately for the day. Eat a good breakfast. Remember to pick up your essential equipment; your money, this sheet, camera (?), sunglasses, folders, umbrella or raincoat (??). It might be well to have these things assembled beforehand.

5:50 A.M. (No later) Present yourself at the East Door of Main Building. Report immediately to your bus sponsors. Pick your place in our chartered busses.

6:00 A.M. We're off, and we hope you're with us. Route 97 is our route all the way.

6:10 A.M. So this is Knoxville, one-time county seat of Knox County. The old Court House north of the Square is worth investigating sometime, but we won't stop now.

6:25 A.M. Maquon and Spoon River. Years ago Indian tribes of Central Illinois journeyed for miles to this stream to secure mussel shells of a superior variety for making ladles and spoons. The Indian term for spoon was "amaquon"; hence our Maquon and Spoon River. This too is the country celebrated by Edgar Lee Masters in his "Spoon River Anthology," that rare collection of imaginary epitaphs from a rural graveyard. Read it sometime.

6:30 A.M. Across Spoon River we turn south to Rapatee. At Rapatee we leave Knox and enter Fulton County—on through Fairview.

6:50 A.M. As we travel two miles west through Fiatt, note more strip mines on our left.

7:10 A.M. Now entering Lewistown, county seat of Fulton County —boyhood home of Edgar Lee Masters. We shall see his former home. Our route will take us past the Old General Ross home. It will be pointed out. Ross was a general in the Mexican War. His Southern sympathy in the Civil War caused a Federal guard to be placed around this house for four years. The house is now being torn down.

7:20 A.M. Will be dropping down into Illinois River valley about this time.

7:25 A.M. We should be off 97 now on gravel going west and north to Dickson Mounds. Note other mounds in the vicinity. Dickson is now a state park.

7:30 A.M. Everybody out. We are fortunate in having as our guide, Dr. Don Dickson, trained anthropologist, and son of the Mound's discoverer. This was his boyhood home. Listen carefully to his lecture and be ready to ask questions. He knows all the answers. We shall spend a few minutes in the adjacent museum housing Dr. Payne's collection of relics from South and Central American Indian cultures. Be sure to see it. Note the real log house. We shall see more of such houses in New Salem.

8:15 A.M. All aboard again. Check in at the bus with your sponsors. Now we drop farther down into the Illinois River valley, emerge on the levee blacktop of Route 97 and thus along the flood lands adjacent to the river.

8:30 A.M. Across this new and beautiful bridge lies Havana, an old river town, county seat of Mason County, famous for its fish markets. Take a look at the Illinois as we cross. From its waters white men first saw this country around 1675. Remember Marquette and Joliet? From Havana we move southeastward through Mason County on a beeline for Springfield.

8:45 A.M. We shall be crossing the Sangamon River about now and entering Menard County.

9:00 A.M. Here is old Petersburg, county seat of Menard County, successor to Lincoln's New Salem. We'll see more of it tonight on our return when we visit the Ann Rutledge grave.

9:10 A.M. Watch for glimpses of New Salem; on your left is the old grist mill, on your right lies the park proper. Note the Wagon Wheel Inn. It will see more of us tonight at 5:30. Twenty miles to Springfield now.

9:30 A.M. Approaching Springfield! Who will see the Capitol dome first? By the way, we have been in Sangamon County for 10 minutes. Can you name all the counties we have traversed? Your grandparents will be proud of you if you can.

9:45 A.M. This is Springfield, city of 80,000 souls, capital of the great state of Illinois, county seat of Sangamon, cultural center. Chief industries: railroads, insurance, and small manufactories; home of Illinois State Fair—we'll try to park north or east of the Capitol building. Take a look up. Yes, it's higher than the Capitol in Washington. Note monuments to Illinois' famous sons.

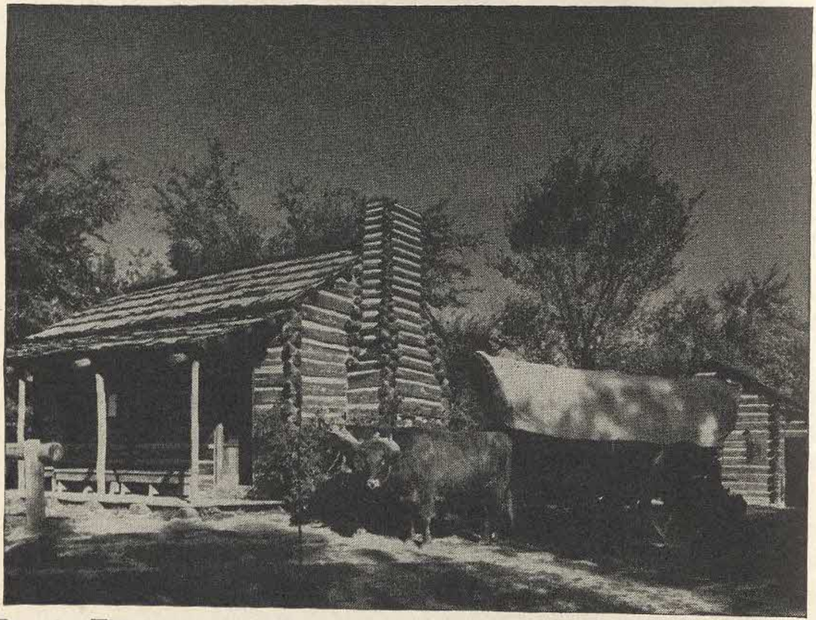

FIG. 12. The ox team and Conestoga wagon alongside the Hill-McNamar store in New Salem, Ill. (*Courtesy of Division of Parks, Springfield, Ill.*)

9:50–10:00 Free time in Capitol. Reassemble under dome on first floor at 10:00 sharp.

10:00 A.M. Here we are ready for the inspection of our Capitol. The Secretary of State has furnished guides. You will be interested in the various state offices. Watch for the fine marble in walls and columns, the many murals, exhibits, and statues. Consult your "Guide to Illinois State Buildings." We may be able to see into the House and Senate Chambers. Maybe we can peak into the Governor's office also. Don't miss the eight huge bronze statuettes and the bas relief frieze high inside the Capitol dome. Everyone stay together here; we lost two girls here for a spell last year. (We found 'em again.)

10:30 A.M. Now for a look at the new Archives (Records) building. Maybe we can take the subterranean tunnel across from the Capitol. Here 15 miles of steel filing cabinets and numerous vaults protect state records. If you were born in Illinois, your name no doubt is to be found in these files. (We won't look it up, however.)

10:45 A.M. In 1918, the state erected the Centennial Building. It's next. As we go, notice the statues on the State House grounds. (The light should be about right for pictures of the Capitol.) Inside we shall visit Memorial Hall and its regimental flags on the first floor, and the state Historical Library and Lincoln Room on the third floor. Too bad we can't stay longer here, but maybe you can come back sometime.

11:30 A.M. Across the street, east now to "do" the Supreme Court Building. If court is in session, we must be very quiet; if adjourned, maybe we can get inside the court room. Note the fine walnut paneling.

11:40 A.M. Back north or east of Capitol to our bus, but before we go, let's look at the new armory, home of the Illinois National Guard. We can't go in—or can we?

11:45 A.M. Report at bus for instructions. Two or three blocks east lies the business district. You will be "on your own" till 1:00 P.M. when our busses leave here for Lincoln's home. Eat a good lunch—or is that advice necessary?

1:00 P.M. Report back to our busses. Be on time. On our way to Lincoln's home (1837–1860), perhaps we can catch a glimpse of the Governor's mansion. Sorry we can't stop.

1:05 P.M. Arrival at Lincoln's home. Competent guides will take care of us here. Listen carefully and question liberally. Have you used your notebooks yet? How about a snapshot?

1:30 P.M. Embarkation for the Lincoln tomb in Oak Ridge Cemetery. On the way we shall pass the Old State House, now the Sangamon County Court House. This 103-year-old building is rich in Lincoln association as it served as State Capitol until 1875. Here the Great Emancipator served in the legislature, appeared in court, debated

Douglas, and here, finally, his body lay in state on May 4, 1865, before burial at Oak Ridge Cemetery. If possible, we shall stop at Vachel Lindsay's home also.

1:45 P.M. Oak Ridge Cemetery and the Lincoln tomb. Within the tomb we may have as our guide old Mr. Fay. For over twenty-five years he has been custodian here and knows more Lincoln lore than anyone in Springfield. Ask him about the kidnap plot. Perhaps we can get Mr. Fay to show you his collection of materials. Let's get some movies here. Relax a bit. We are in no big hurry now. In the passageway note the "statuettes" depicting Lincoln's career, also the many fine marbles collected from all over the world. We can go up the stairs to the shaft on the exterior. Note the fine symbolic statuary at the shaft base. Once visitors could ascend the shaft, but now it is closed. See the red Italian stone on the south wall from the tomb of Servius Tullius (??) donated by the citizens of Rome. Get your pictures. Caution: This is a tomb of one of the world's greatest men. Let us be quiet and reverent in and around it.

2:55 P.M. All aboard and back to New Salem State Park. We may stop at a fancy souvenir "joint" before leaving Springfield. Take it easy here.

3:00 P.M. New Salem State Park—hold your hats, get ready for the "Time Machine." We're going back over one hundred years to the frontier village of Lincoln's early manhood (1831–1837) patiently and painstakingly restored by the state. Here competent guides will show us through the village. Keep alert for details. Don't hesitate to question. We shall see the Rutledge Tavern, the restored Lincoln-Berry store, and the post office. (How about a card home?) Notebooks and cameras should be busy here. Everyone stay together, please. You will be given some leisure time later. Upon dismissal, you are to be given until 5:30 for seeing the park on your own.

4:30 P.M. For the next hour, you are truly on your own. Maybe you will wish to walk down to the old mill or go back over some of the cabins, or just possibly, sit under a tree. We will be trying to finish our roll of movie film. Action!

5:30 P.M. Dinner in the main dining room of the Wagon Wheel Inn. It is down the hill at the park entrance. We will all walk down leaving our busses at the parking lot. How do you like the place? The management said we could sing. How would they know? Do we want any speeches? "What's that, only from teachers? Well, all right, if you insist."

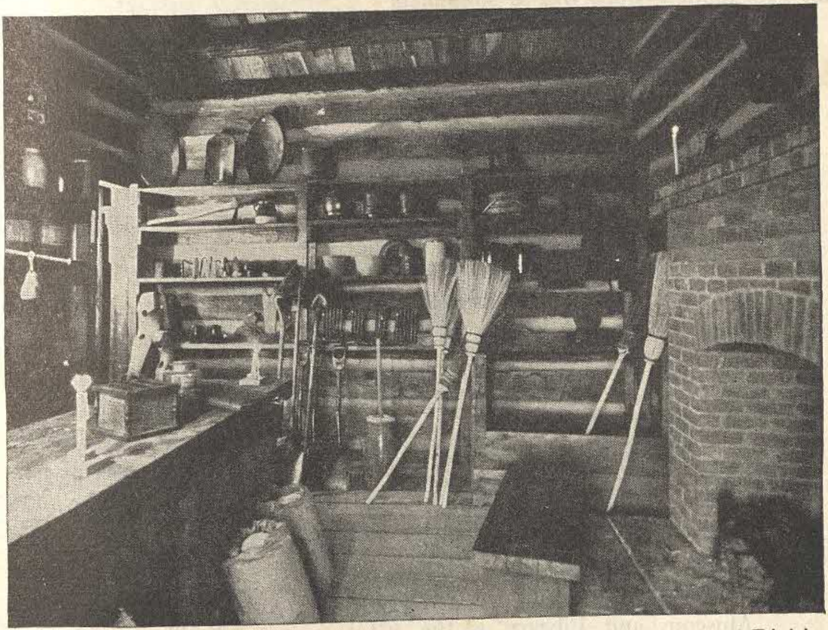

FIG. 13. Interior of Hill-McNamar store, New Salem, Ill. (*Courtesy of Division of Parks, Springfield, Ill.*)

6:30 P.M. Check in at the bus at the Wagon Wheel parking lot and we bid farewell to New Salem.

6:45 P.M. Petersburg, and we leave the pavement one mile to visit the grave of Ann Rutledge. You remember the story from biographies you have read and the film "Abe Lincoln in Illinois." Is there light enough to photograph the inscription on the monument? Remember too, that this is a cemetery and that it calls for our best cemetery manners.

7:00 P.M. Everybody here? If we are lucky, this is the last time we need to count noses.

7:10 P.M. On the trail back home. Getting dark now. Stay awake there. Maybe we can sing now that it's dark.

9:00 P.M. to 9:30 P.M. Galesburg and goodnight. You should be tired enough to go straight home; however, if you don't, remember to call your folks and announce your safe return. (Don't forget to throw that alarm clock out of the window.)

III. Examination—study trip to Springfield

A. Completion:

Springfield is the (1) ______ capital city of Illinois. Other places which have served as capitals are (2) ______ and (3) ______. Illinois became a state in the year (4) ______. A famous Illinoisan who helped move capital to Springfield was (5) ______ ______. Illinois' first governor was (6) ______ ______. The present governor of Illinois is (7) ______ ______. Lincoln's family migrated through the states of (8) ______ and (9) ______ before they settled in Illinois. County in which Springfield is located (10) ______. (11) ______ is the county seat of Fulton County. River upon which Havana is located (12) ______. New Salem is on the (13) ______ River. Springfield Cemetery in which Lincoln is buried (14) ______ ______. Lincoln was inaugurated president in the year (15) ______ and was assassinated in the year (16) ______. Galesburg is situated in the (17) ______ state senatorial district. There are (18) ______ senators in the state Senate and (19) ______ representatives in the House. There are (20) ______ counties in Illinois. Building housing State Museum and Library is the (21) ______ Building. One of Galesburg's representatives in the state legislature is (22) ______ ______. (23) ______ ______ represents Galesburg's district in the state Senate. Mines where coal lies near the surface and may be secured by removing the earth are called (24) ______ mines. When New Salem was abandoned, most of its residents moved to the nearby town of (25) ______. The judges of the Supreme Court of Illinois are (26) ______ in number. It is (27) ______ miles to Springfield as we traveled. Lincoln served as a captain of volunteers in the (28) ______ ______ War. One writing of Edgar Lee Masters was his (29) ______ ______ ______. Vachel Lindsay wrote (30) ______ ______ ______. Carl Sandburg is a noted biographer of (31) ______. The Lincoln-Douglas debates were held in the year (32) ______ while these men were candidates for (33) ______. Two Illinois cities other than Galesburg where debates were held were (34) ________ and (35) ________. The five famous Illinoisans represented by statues on the east lawn of the Capitol are (36) ________ (37) ________ (38) ________ (39) ________ and (40) ________.

B. Matching

__Denton Offut
__George Rogers Clark
__Jacques Marquetter
__Stephen A. Douglas
__David E. Shanahan
__Ann Rutledge
__John Wilkes Booth
__Mentor Graham
__Vachel Lindsay
__Mary Todd
__Edgar Lee Masters
__Henry Rainey
__U. S. Grant
__Billy Herndon
__Wm. Randolph Hearst
__Richard Yates
__Nancy Hanks
__Carl Sandburg
__Henry Onstot
__John Allen
__Daniel French

1. Assassin of Abraham Lincoln
2. Governor of Illinois during Civil War
3. One of New Salem's original physicians
4. Schoolmaster of New Salem
5. Author of "Spoon River Anthology"
6. Lincoln's stepmother
7. Lincoln's wife
8. French missionary–early explorer of Illinois River
9. Galesburg poet and Lincoln biographer
10. New Salem storekeeper for whom Lincoln worked
11. Illinois general who rose to top rank in Civil War
12. Veteran speaker of Illinois House
13. Law partner of Lincoln in Springfield
14. Newspaper publisher active in restoring New Salem
15. Lincoln's New Salem sweetheart
16. Opponent of Lincoln in series of debates
17. Sculptor of seated Lincoln in lobby of tomb
18. The barrelmaker in New Salem
19. Famous Illinois speaker of U.S. House
20. Conqueror of Illinois country in Revolutionary War

C. True-False

___ 1. Abraham Lincoln served one term in the U.S. House of Representatives.

__ 2. The present state Capitol is the second Springfield building to serve in that capacity.
__ 3. Springfield ranks second to Chicago in size among Illinois cities.
__ 4. New Salem was the birthplace of Abraham Lincoln.
__ 5. Lincoln lived in New Salem until 1867.
__ 6. Lincoln first came to New Salem on a river flatboat.
__ 7. For a time Lincoln served as postmaster at New Salem.
__ 8. New Salem was selected as a place of settlement because it was in a timbered area.
__ 9. No attempt was made in restoring New Salem to place reconstructed buildings on original sites.
__10. Evidence that the Indians had no religious beliefs abounds at Dickson mounds.
__11. Many of the skeletons in Dickson Mounds indicate violent deaths such as those occurring in war.
__12. Skeletons in the Mounds are thought to have been there nearly one thousand years.
__13. Dickson is the only Mound of its kind in Illinois.
__14. A cooper was a maker of barrels and kegs in frontier days.
__15. Grist mills were used to prepare woolen cloth.
__16. Carding mills provided ground meal for early settlers.
__17. Trundle beds were four-posted rope beds.
__18. None of the buildings at New Salem are original.
__19. Lincoln was first elected to the Illinois legislature while living in New Salem.
__20. In excavating for reconstruction at New Salem, no traces or relics of the earlier settlement were found.
__21. The presence of fire plugs, parked cars, and so on, ruins the atmosphere of the frontier which is sought at New Salem.
__22. Lye for making soap was secured from wood ashes in New Salem.
__23. Lincoln worked chiefly at farm labor at New Salem, earning the title of "Railsplitter" here.
__24. Abraham Lincoln was the father of four sons.
__25. Lincoln's married life was an extremely happy one.
__26. All of Lincoln's immediate family are entombed with him in Springfield.
__27. The old State House now serves as the Sangamon County Court House.

__28. Republicans and Democrats sit on opposite sides in House and Senate.

__29. The State legislature is now in session.

__30. Official presiding over state Senate is the lieutenant-governor.

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[23] See also Part III-*A* of Edgar Dale, "Audio-Visual Methods in Teaching," The Dryden Press, Inc., New York, 1946. This section contains seven chapters of applications, each chapter relating to a particular field of instruction. Teachers of science will find the publications of Science Clubs of America, 1719 North St., N.W., Washington 6, D.C., of very practical value in organizing, programing, and securing material.

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19

ADMINISTRATION AND SUPERVISION OF THE AUDIO-VISUAL PROGRAM

Because audio-visual aids are used at every grade level and in practically every subject field, it is necessary that some one person supervise and coordinate their use. The very nature of the program is such that a director is needed if the program is to operate smoothly and effectively. Irrespective of whether the program is housed in one building and participated in by only a few teachers or in a number of separate buildings and participated in by hundreds of teachers, the qualifications, activities, and the problems of the director remain about the same. Further, in all school settings regardless of size the audio-visual program cannot rise above the plane of vision of the person responsible for it.

Because there are many more small schools than there are large, it is pertinent here to digress long enough to point out a trend that promises much for these smaller schools—the development of county or district organization for audio-visual service. The audio-visual center is organized and administered in much the same way as that of the city and provides about the same services. It circulates equipment and materials, organizes in-service training programs, arranges demonstration lessons, conferences, supervision, and so on. In some instances for isolated rural schools, it even provides power necessary for motion pictures by means of a generator-trailer hitched behind the director's car.

Each school purchases the equipment and materials which it can afford and for which it has sufficient use and then contributes its share to finance the audio-visual center, the purchase of the more expensive equipment and materials, and those which are used less frequently.

Most of these materials are sent to the schools by one-day parcel post or railway delivery.

In the opinion of one investigative committee, a well-balanced library of audio-visual materials can be maintained in a county or district which has an average daily attendance of around 12,000 pupils and which is compact enough so that the center will not have to serve schools farther away than 60 or 70 miles.[1] Where the attendance is less than this, it may be desirable to cooperate with other county or city audio-visual departments.

As the person appointed to develop and supervise this audio-visual program, whether in city or country, has numerous important duties to perform, he should be selected and trained most carefully. This is especially true if the school or system is just initiating a program. His relationship to the administrative and instructional staff should be understood by all. Obviously, because he is working with practically every department and instructor in the school system, he is in a position to make valuable contributions to all these. And all his coworkers should appreciate this fact. A good audio-visual program cannot be developed without an efficient system of administration, and this cannot be developed without an interested and competent director.

QUALIFICATIONS OF THE DIRECTOR

The basic nature of the audio-visual program is such that it requires a considerable degree of centralization. Projectors, films, screens, and other equipment must be kept at some center from which they can be obtained by the teacher when needed. The classroom instructor will not use these materials unless they are on hand when needed and can be secured without too much "red tape." The director personifies this center.

The director of the audio-visual program is not only an educational leader but he is also a businessman because he is responsible for the annual investment of a considerable amount of money. Hence it is obvious that he must possess qualifications of a high order. The following are suggestive:

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[1] The Audio-visual Education Committee of the California School Supervisors Association. A digest of the report of this group, "Suggestions for the Organization of a County Audio-Visual Education Program," will be found in James McPherson's article, Pattern for Tomorrow, referred to on p. 557. See also the articles by Bartles, Denno, and Wicklund on pp. 556–557.

1. The director should have a wide acquaintance with the objectives and subject matter of the various grades from primary through high school, and he should be familiar with progressive methods of instruction.
2. He should be acquainted with the purposes and functions—and also the problems—of the audio-visual department.
3. He should have a good understanding of the different types of aid, their place, scope, and function.
4. He should be thoroughly familiar with the techniques and procedures for utilizing audio-visual aids as a regular part of the instructional program.
5. He should be able to help select the audio-visual aids that contribute to the major educational objectives. His educational background should be sufficient to warrant his holding a permanent place on the curriculum committee.
6. He should possess initiative, courage, vision, tact, and ambition and the personality that attracts teachers and co-workers.[2]
7. He must have considerable administrative and executive ability.
8. He should possess a certain amount of mechanical skill because in many instances, especially in the smaller systems and schools, he will be called upon to make minor adjustments and repairs.
9. He should possess the respected qualities of leadership, not the least important of which is the willingness and the ability to learn.
10. He must be able to interpret the program not only to the teachers and administrators but also to the general public.

Perhaps an individual possessing all these qualifications is rather a rarity. On the other hand, when one appreciates the responsibility invested in such an officer, one can easily see that it is logical to assume that not just anyone should be charged with it. Undoubtedly, as experience brings maturity in this field, these officers will be very definitely trained for the position. At the present time they can widen their knowledge and increase their skill through college and university courses, books and magazines, conventions and conferences, visits and consultations, and in other ways.

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[2] One of the three critics who read this chapter while it was in manuscript added "and most of all, good common horse sense."

DUTIES OF THE DIRECTOR

Naturally, the work of the director varies with the size of the school system in which he is employed. The problems and activities are, as stated above, fundamentally the same, but, of course, the larger system calls for more time on the part of the individual in charge, as well as more assistants, and increased housing—offices, workroom, storage, and other space and equipment. The suggestions given here are more or less basic and thus may be modified to meet the needs of the director of the audio-visual program in almost any system, large or small.

FIG. 1. Motion-picture films must be stored efficiently so that they can be identified readily and removed easily. (*Courtesy of Detroit Public Schools.*)

The administrative and supervisory duties of the director are numerous and varied; some are financial, some are clerical, some are educational, and others are of a mechanical, distributive, and coordinative nature. A brief consideration of the more important of these responsibilities will show their general nature and also indicate why, in a large setting, an active audio-visual committee, responsible building coordinators, and competent assistants are needed in administrating the program.

Selecting the audio-visual committee and the building coordinators. One of the first duties of the newly appointed director will be to work with the staff and select the members of the audio-visual committee and the building coordinators. It is impossible for the director to carry out the manifold duties of his department without the assistance of an energetic committee. The members should be selected, one from each building or department, to represent the entire staff. The chief function of this group is to work with the director in coordinating administrative and teaching procedures.

The building coordinator should be responsible for the audio-visual program in his building. He should see that materials and equipment are delivered to the classrooms at the time specified. He must also see that these materials are returned to the audio-visual center on schedule. In fact, the building coordinator is really the audio-visual director of his particular school. He should, therefore, have many of the same qualifications as the director.

Appointing assistants. It is just as unreasonable to expect the director of the audio-visual program to get along without assistants as it is to expect the superintendent to do his own clerical work. If the director has to spend much of his time in doing the detailed work of his department, then he is little more than a high-salaried office boy; he is hardly an expert audio-visual program director. Here again, the number of assistants will depend upon the size of the system, but in a medium-sized or larger system there is a place for (1) a clerical assistant who handles the details of records, requisitions, orders, correspondence, filing, and so on; (2) a mechanical assistant who checks the conditions of all materials and equipment, makes minor repairs, and does other types of servicing; and (3) an assistant who delivers and returns materials and equipment and is responsible for the storeroom. Whether these be part-time or full-time employees, it is reasonable that they should be selected, trained, and supervised by the director or by the director and his audio-visual committee.

Preparing the budget. This is one of the most important duties of the director. The budget must provide for (1) operating expense of the audio-visual center (this includes salaries of the director and staff); (2) purchase and rental of materials; (3) purchase of equipment—projectors, screens, darkening shades, and so on; (4) maintenance of materials and equipment; and (5) distribution of materials and equipment.

In setting up the budget both the immediate and long-range requirements should be considered. Then, if possible, a purchase plan should be developed that will itemize definite and regular annual expenditures. During the first few years the cost of equipment will be one of the major items of expense. However, as this cost tapers off, the amount set aside for the rental and purchase of materials can be increased.

Supervising the staff of the audio-visual center.[3] Since the success of the audio-visual center is measured in terms of the contributions of these aids to the educational program, efficient operation of the department is necessary.

One of the major functions of this staff is to see that the equipment and materials requisitioned by the various instructors are in the classroom at the time they are needed. In case of rented aids it must, of course, do the ordering.

Further, the staff must see that the equipment is in good running order and that the material is in usable condition; equipment not in good running order and materials that are worn, torn, or broken will handicap their use. Every piece of equipment should be inspected at regular periods to make sure that each is in good condition. Materials should be checked each time they are used to see that they have not been damaged; if they are not suitable for use because of damage and cannot be repaired, they should be destroyed.

There are numerous records to be kept in order that materials and equipment can be located readily. Forms and records for checking materials out of the center for class use should provide all information needed, but they should be short and devoid of complications.

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[3] Here again, irrespective of the size of the school system, there is always an audio-visual center; it may be a table in the corner of the principal's office, or it may be a well-equipped separate building.

Teachers will hesitate to use the materials if they are required to fill out lengthy forms.

Before deciding on a system of forms or records, the director and the members of the audio-visual committee should visit schools that have programs in operation. The forms used by each can be studied and compared. The good points of these can be incorporated in those developed for the particular school.

Many audio-visual directors have had to start from "scratch" and to develop their own system of forms. Although they learned by the "trial and error" method, it is not necessary for those now appointed to this position to continue that expensive process. A few days spent in visiting efficiently functioning audio-visual centers will enable them to avoid many costly mistakes.

The director is responsible for the audio-visual center and should be held accountable for its effective operation. Naturally, a well-trained audio-visual center staff is a most important asset.

Purchasing equipment and materials. The audio-visual director will purchase or supervise the purchasing of equipment and materials. Through carefully prepared records he should be able to determine which machines have given the best service with the minimum expenditure for maintenance. In smaller schools he should know where to contact sources of such information. He will need to spend considerable time in studying new material as it comes on the market in order that the department can be kept up to date. Although he will purchase slides, films, pictures, and other materials, he should not assume complete responsibility for the selection of these. The teachers who will use them should have the major say in their selection. The director's work in this area will be of an advisory nature. However, the director will in most cases select projectors, screens, curtains, and similar equipment, as well as contract for, or otherwise provide, such necessities as projection booths, electrical connections, mountings, and the like.

Conducting faculty meetings. The general faculty meeting represents a most significant opportunity for training teachers in the philosophy, psychology, and practical procedures of the audio-visual aids. Properly capitalizing this opportunity is one of the director's most important responsibilities. He may do this at regular or specially called meetings, or both. At these meetings he will explain the educational objectives that have been set up, the general policies of the department, and the procedures to be followed in requisitioning, utilizing, and evaluating the various types of aid, and in other ways he will promote the aids-education of the teachers. Just about as important, the director will not only teach the instructors but will ensure that they teach him. In a free-and-easy, give-and-take atmosphere he can undoubtedly learn much from the reactions, questions, comments, and general attitude of the faculty members which will be beneficial to him in his work. The general faculty meeting, as well as similar departmental or smaller meetings, represents group assistance or group instruction in the use of aids.

Assisting teachers individually. A second type of assistance that the director is in position to give to the members of the faculty is individual instruction. This differs from group assistance only in that it is adapted to more specific needs in more limited areas. Although part of this may reflect somewhat theoretical philosophy and psychology, nearly all of it will represent practical procedures. What should be done? When? Where? How? Why? These are the types of question that must be answered very specifically with particular settings, materials, and pupils in mind.

It would, of course, be unwise to assume that all teachers (or supervisors) have the same interest or competency in, or the same experience with, all types of aid and, for that matter, the same need for all of them. The teacher, depending on her training, experience, and setting, may need help on a number of types of aid, or she may need help with only a limited number, or she may need help in highly particularized situations. Naturally, then, one of the first jobs of the director is to survey his group and locate interests, experiences, and needs; in short, to locate strengths that require only maintaining and further capitalization and weaknesses that require strengthening. Here again, an informal approach is far preferable to a rigid, dictatorial "now-here's-the-way-you-should-do-it" type. A complimentary pat on the back for good work and a bit of well-placed and inoffensively given criticism for poor work represent two helpful procedures in any type of superior-inferior relationship. The practical procedures to be used in connection with the various types of aid have already been suggested in connection with these and need not be repeated here.[4]

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[4] See also Chap. 3.

A further discussion from a slightly different angle will be found in the section on teacher training.

In this relationship also, the director should be a learner as well as a teacher. He can learn subject matter, which aids are apparently the most suitable and profitable with particular kinds of material and pupil, and he may even learn techniques from the more successful teachers and supervisors. His learning should, naturally, then be capitalized in different settings with other teachers and other types of materials.

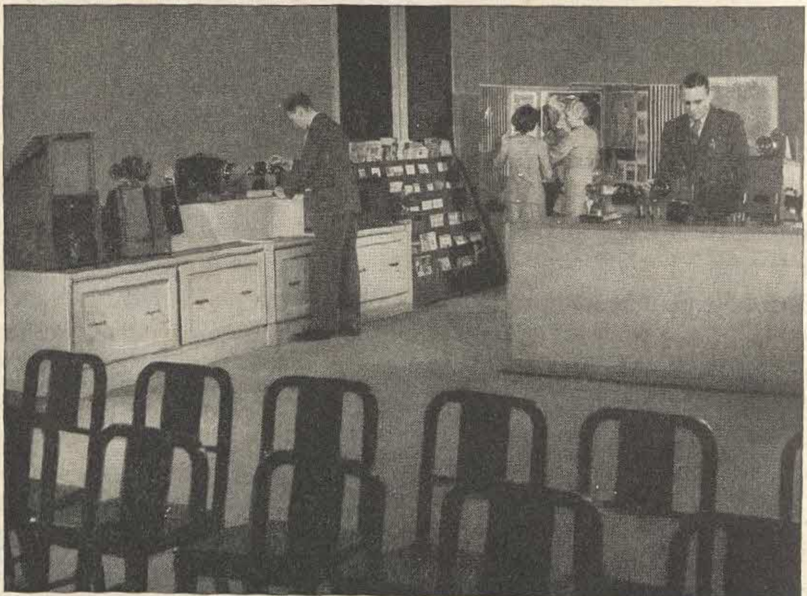

FIG. 2. A corner in the teaching laboratory of the Audio-Visual Department of the University of Iowa. Note the variety in types of equipment and materials available for individual and group use.

It is pertinent to emphasize in this connection that the director does not replace the teacher. A few years ago it was quite customary for this individual, especially in the use of motion pictures, to secure and present the film and also, in the case of silent films, to give the lecture. Sometimes he would gather up his belongings and leave after running the film, and sometimes he would remain and teach the remainder of the lesson. Even recently in some schools visited by the authors this same procedure was still being followed. Fortunately, such a practice is not very common, and it will be still less so when both the teacher and the director realize their proper responsibilities. An occasional demonstration by the director is quite desirable, provided he is competent in subject matter, but a substitution for the teacher is quite another matter.

Assisting supervisors. If there are supervisors in the school system, the director will work to a considerable extent through them because they know more than he about their subjects and are in closer contact with the teachers under them. The director may assist by (1) planning with supervisors and their teachers; (2) visiting classes with the supervisors; (3) organizing simple experiments; (4) holding individual conferences and group meetings; (5) providing demonstration lessons; (6) preparing bulletins and other similar instructional material; (7) developing and adapting aids; (8) promoting open-house exhibits and other events; and (9) arranging for teachers and supervisors to visit other classes and other schools, attend and participate in educational meetings and conferences, and so on. Naturally, the relations between the director and the supervisors should be mutually cordial personally and respectful professionally.

Arranging demonstration lessons. A demonstration lesson is concrete, practical, and pertinent, and therefore represents one of the best mediums for acquainting teachers with the possibilities and the correct utilization of audio-visual aids. This is especially true if the lesson has been planned with "a head and a tail"—unhurried pre-lesson and post-lesson discussions of it. There is always a possibility that such a lesson may be a sort of staged performance, a rehearsed production, but even this does not necessarily handicap effective illustration; in fact, sometimes it may enhance it.

On the other hand, many otherwise excellent classroom demonstrations lose much of their significance and value when presented to the faculty as a group because of their (1) formality—they are staged as a sort of rehearsed dramatic production and (2) incompleteness—they fail to show the "head and tail" of the lesson. Hence, in addition to watching demonstrations before a group, teachers should be encouraged to visit certain classes individually. This will give them an opportunity to see the materials actually being used as they were designed to be used. An accurate schedule of the week's possibilities, showing what, where, when, by whom, and in what connection the various aids are being utilized will help the members of the faculty to choose their visit objectives intelligently.

The director should be able to teach a good demonstration lesson in his own field, and perhaps in related subjects as well. However, it will be impossible for him to teach these lessons in all grades and all subjects, and he will have to schedule the more competent teachers or supervisors, either from the same school or from other schools, for many of them. At the same time, it is reasonable to expect the director to be able actually to demonstrate what he is attempting to do in his field. Also, his demonstrations will help him to win the professional respect of his teachers, without which there is no effective supervision.

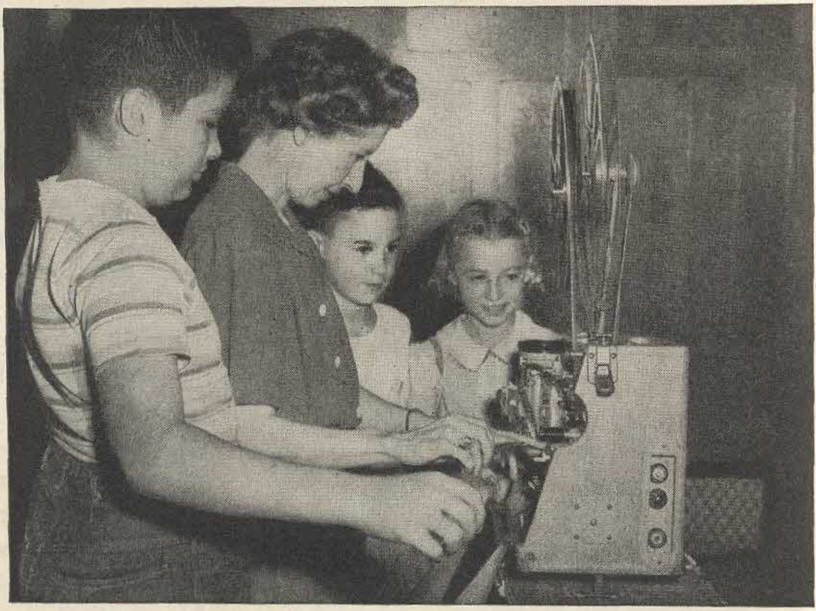

FIG. 3. Here two fourth-grade and one seventh-grade Des Moines, Iowa, pupils are being taught to thread a motion-picture projector. (*Courtesy of Floy Vest, Des Moines, Iowa.*)

Preparing handbooks, bulletins, and other publications. Enlightening teachers will always be an important part of the director's work if for no other reason than that new devices and new applications of older devices will always be appearing. And, of course, new teachers will be continuously coming into the school system, and these will need information concerning the audio-visual department's organization and functions, equipment, materials, routines of requisitioning and handling aids, and so on. An economical method of providing this information is through handbooks, bulletins, syllabuses, booklets, and other simple publications for the teacher's use. In general, these publications may be classified into two types: (1) those concerning the mechanics of handling the aids and (2) those designed to help the teacher actually use these materials. There are also combinations of these two types.

The first type of publication deals with such processes as how to operate, adjust, repair, and care for projectors, sound systems, phonographs, and the like; how to make lantern slides, models, and maps; how to design and construct exhibits; and how to trim, mount, label, and store photographs and prints. Much of this material comes from instruction booklets issued by manufacturing companies. Some of it comes from descriptive articles in magazines and books, and, of course, some of it represents adaptations and more or less original contributions by the teachers themselves.

The second type of publication is more of a teacher's guidebook, planbook, or manual on how to utilize audio-visual aids. It varies in size and content all the way from a simple sheet of more or less general suggestions to rather detailed course syllabuses or outlines, which the teachers may follow. The most complete of these bulletins include detailed lesson plans with assignments, reviews, questions, pretests, final tests, and so on, as well as the specific aids to be used, and where and how they are to be used. Naturally, if this material is prepared by local teachers and experimented with, after repeated usage it becomes more or less established. Probably, too, it represents mature experience and is, therefore, rather substantial. On the other hand, it can never be accepted as final; adaptations and changes will always be necessary if for no other reasons than that (1) old equipment and materials become obsolete and (2) new equipment and materials are constantly appearing.

Evaluating the program. Large amounts of money are being continuously spent in educational systems and institutions in attempting to discover high and low places in policies, materials, and techniques, and these expenditures are justified if they result in improvement. Similarly, with the audio-visual field, the expenditures of time and money must be evaluated as accurately as possible in order to improve the program and thus justify these investments. The director must accept this as another of his responsibilities.

There are a number of items that must be considered in this program of evaluation, and these, for our purposes here, will be grouped into three classifications: (1) expense, (2) the extent to which available equipment and materials are used, and (3) the manner in which the equipment and materials are used. A short presentation of each of these will show its place in the evaluative program.

Expense. It may seem to some individuals that the cost of a sound projector, a radio, or some other piece of equipment of a similar nature is out of proportion to the value that will be received from the use of it. However, it is well to remember that it is possible to use it in every grade from the primary on through the high school and in practically every subject field. It can become one of the most widely used pieces of equipment in the entire school system. Because of this wide use, the per-pupil cost of a projector is very small, much smaller than the per-pupil cost of typewriters or other machines or devices that can be used only for limited periods and in connection with only certain classes or groups.

In order that the director may have a basis for comparing the costs of the audio-visual department with those of other departments in the school, he should reduce it to a per-pupil basis. For more effective administration, the director should also know the cost per school where there are several schools in the system. These per-pupil costs are comparable, if they represent about the same educational settings, and a knowledge of them will enable the director to make a more equitable distribution of materials or at least to know where more work is needed in order to secure this distribution. Likewise, the director will find the per-department cost very valuable, especially when requesting new materials. The record of cost per department may reveal areas in which they are being used excessively. These comparisons may indicate where more missionary work is necessary in order to secure the cooperation of the lagging departments. If the chief cause of unfavorable comparisons is lack of materials, he can plan to provide these.

Extent to Which Available Materials Are Used. The per-pupil or per-department cost is not a safe sole criterion on which to judge an aid's value. Some of the aids are relatively expensive, and others are relatively inexpensive. Consequently, a second phase of evaluation concerns the number and types of audio-visual devices used by the various teachers or departments. What was used by each teacher or department? How many times was it used? These are questions that give the director a quantitative evaluation of the program.

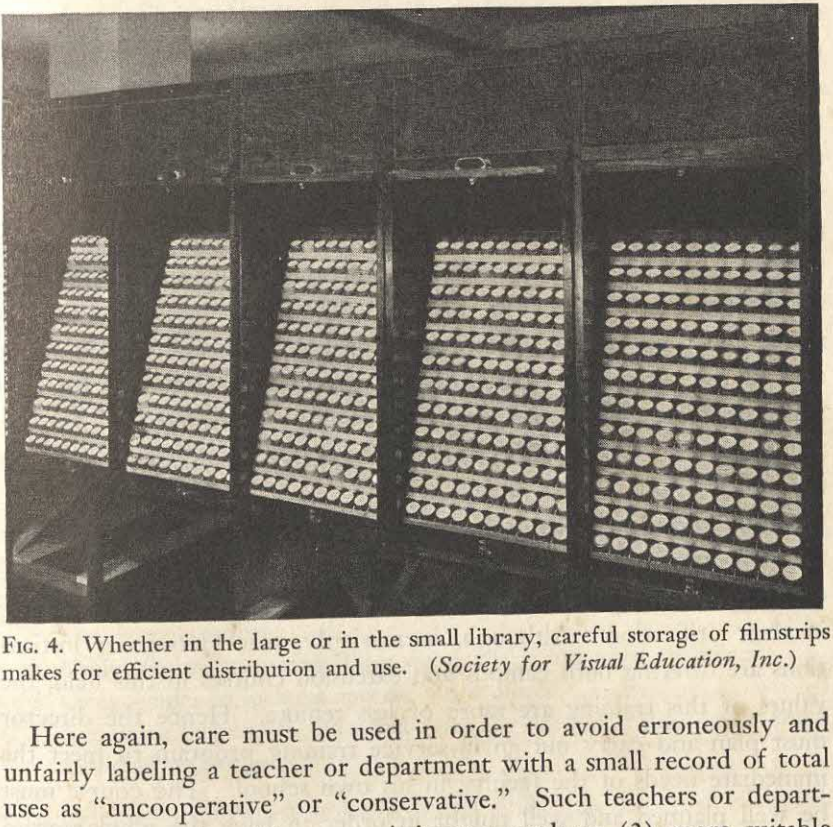

FIG. 4. Whether in the large or in the small library, careful storage of filmstrips makes for efficient distribution and use. (*Society for Visual Education, Inc.*)

Here again, care must be used in order to avoid erroneously and unfairly labeling a teacher or department with a small record of total uses as "uncooperative" or "conservative." Such teachers or departments may require (1) some missionary work or (2) more suitable materials. Perhaps their low records can very properly be blamed on the director himself.

From this quantitative record of use the director will be able to discover those aids which have been overused and those which have been underused. In the case of the former, it may become obvious that additional units are needed; and in the case of underuse it may be desirable, if interested and cooperative teachers do not utilize the devices, to dispose of them. In short, a quantitative evaluation is a sort of measuring stick by which the director judges the relative popularity of the various devices or aids.

Contributions to the Educational Program. The expense of the materials and the number of times they are used represent only indirect measures of the value of the aids program. The most important evaluation, naturally, concerns results accomplished. This qualitative analysis of almost any educational setting or material is difficult to make because (1) many of the real effects or results may not show up clearly for years and (2) differentiating and evaluating the forces or influences that created these results is difficult. Even though they are not accurate measures, both subjective and objective evaluations of such items as student and group records, apparent interest, extent of participation, class atmosphere, and disciplinary problems will, undoubtedly, show something about the results obtained. More accurate measurement can be made on the basis of controlled experiments, but these are not always either possible or desirable. Comparisons of the records of individuals and groups with others is a looser form of this controlled experimentation but is valuable. As was pointed out in Chap. 3, the students themselves should help to make these evaluations.

Planning and conducting the in-service training program. As in any new educational field, one of the main retarding influences to the more extensive use of audio-visual materials is the teachers' lack of training in their utilization. Although, increasingly, teacher-training institutions are offering both campus and extension courses in this field, the values of this training are more or less remote. Hence the director must plan and carry out an in-service training program to meet the immediate needs of the faculty in his own school. The course must be well planned and well taught in order to have the wholehearted support of the administration and faculty. The following outline includes the major topics to be covered in such a training program.

1. Objectives

  a. To help the teacher to recognize and appreciate the place and possibilities of audio-visual aids in general

  b. To familiarize the teachers with the literature in the field, both descriptive and evaluative

- *c.* To teach the basic principles to be observed when using audio-visual materials
- *d.* To acquaint the faculty with the various types of audio-visual aid, their instructional possibilities, and the advantages and limitations of each
- *e.* To demonstrate the different types of equipment and to provide instruction in operating them
- *f.* To familiarize the group with the techniques and procedures to be observed when utilizing these tools in the classroom
- *g.* To acquaint the staff with the audio-visual center and its services
- *h.* To show the procedures to be followed in requesting materials or service from the center
- *i.* To acquaint the faculty with the various sources from which these materials may be obtained

2. *Skills to be acquired:* The audio-visual course should be based upon actual laboratory activities that will assist the staff in acquiring the necessary skills. The following will illustrate:
   - *a.* Operating all types of still-picture projector—opaque, 2″ x 2″, standard slide, filmstrip, and micro
   - *b.* Operating motion-picture projectors, both silent and sound
   - *c.* Learning to place the projector and screen in order that all observers will be seated in the correct viewing angle
   - *d.* Operating recording and playback machines—disc, metal tape, or wire
   - *e.* Recognizing and compensating for ear defects when using auditory aids
   - *f.* Making handmade slides
   - *g.* Making microslides
   - *h.* Using camera in making slides, either black and white or color
   - *i.* Using guides to locate a specific aid required
   - *j.* Acquiring techniques and procedures for the best utilization of these materials in the classroom

In order to attain these objectives and skills, the director will need to work with many of the instructors individually or in small groups; therefore, the in-service training program should extend over a considerable period of time. In fact, in one way the course must be continuous because of the appearance of new equipment, materials, and applications.

If the director is to be able to assist the members of the staff in selecting suitable materials, he will need to do considerable previewing and auditing. He must also arrange for the members of the faculty to preview the materials. Some directors also ask students to help in these preview and evaluative activities.

Because of his many responsibilities it may not be possible for the director to handle all the teaching details of this in-service training. It might not be wise even if he had the time. There may be members of his staff or teachers in the school system who are especially competent in the utilization of particular types of aid, and their interest and competency should be capitalized in instruction. Such a plan will not only bring variety to the course, but it will also mean an added appeal because of the personal contacts and relationships of these instructors with the other members of the faculty.

Coordinating and supervising the use of sound equipment. At the present time the radio, as a tool in classroom instruction, is just in its infancy. However, with the introduction of the centralized sound system and with the cooperation of leading educational institutions, it will soon be recognized as one of the outstanding aids in the field. The director should have charge of this centralized sound system, or, at least, he should arrange the program in such a way that the class or classes requesting a special radio program will have it at the desired time. If records are to be used on the system, the program will have to be arranged just as carefully.

In some of the large city systems several sets of the same slides have been prepared in order that they may be presented in as many as twenty classrooms at the same period. The teacher simply shows the slides that accompany the lecture given over the radio. She changes the slides at a not-too-obvious signal from the speaker. Excellent results have been reported where this method has been used. The chief advantage, of course, is the fact that one well-prepared lecture, given by a leading authority, may be heard in several classrooms at the same period. Because of the expense involved, this procedure will probably be limited to the large city systems.

Planning Methods of Distribution. In a city system the problem of the distribution of materials to the schools and returning them to the audio-visual center is one of major concern because one item must serve several instructors in several different buildings. Usually these materials are delivered daily. In some of the larger cities the audio-visual center operates its own delivery trucks. In the smaller schools it may be more economical to arrange with some individual for this service. Whatever the plan, the materials must be at the proper building when scheduled and must be returned promptly to the center.

Recording Educational Broadcasts. Having it when it is needed is the main problem in the classroom utilization of radio programs.

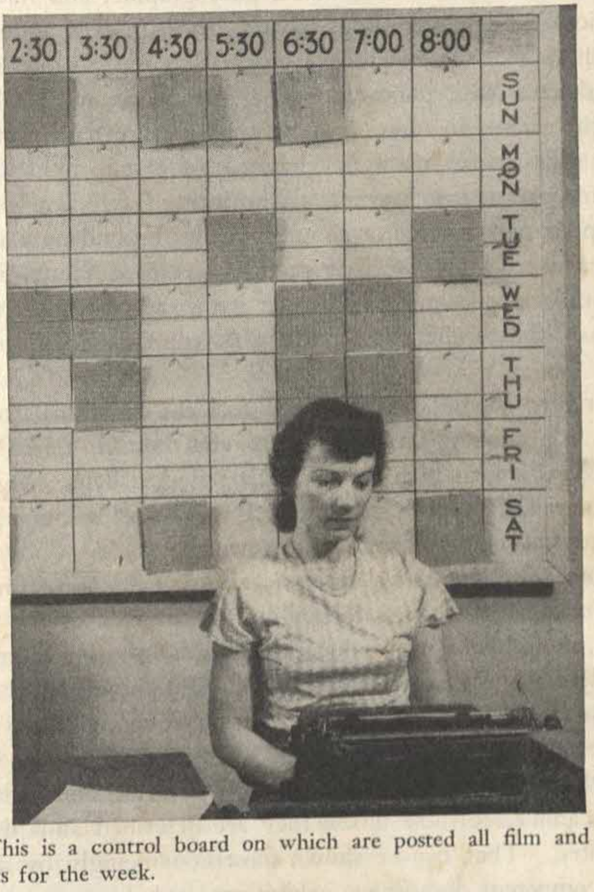

FIG. 5. This is a control board on which are posted all film and equipment assignments for the week.

Many excellent broadcasts are not used because they are not on the air during the period the class is in session. By recording, these programs can be made available when they are needed, and, moreover, they can be used as often as desired. In addition to recording programs designed specifically for classroom use, some effort should be made to utilize commercial broadcasts of a general nature that fit in with special schoolwork or activities. Even a local event such as a concert or address may often be recorded and used to good advantage in school settings.

Assisting the Teachers in Producing Certain Aids. There are numerous aids that can be made by the teachers and students, for example, several types of handmade, photographic, and micro slides, motion-picture films, recordings, charts, maps, models, mounted pictures, and so on. On nearly every school trip there are numerous scenes and items that, photographed, will serve as an excellent summary of the event. In addition, other classes will often find these pictures and slides useful in the development of certain units.

Many teachers visit interesting places during their vacations. With their cooperation the director should be able to build up a library of slides or filmstrips or, for that matter, post-card views, illustrated booklets, objects, specimens, and other items that will meet the needs of many of the teachers in several different types of instructional setting.

The director should be able to counsel the individuals or groups interested in producing these or at least refer them to books, bulletins, and magazines from which they can get practical help. A great deal of this material, if properly mounted, labeled, classified, and filed, can become an important part of the permanent library.

Educating the community in audio-visual ideals and procedures. The school is supported by the public. It, as well as the board of education, should know how educational funds are being spent. Well-planned demonstrations given before the PTA, luncheon clubs, civic bodies, and community gatherings of various kinds will help in building public support for such a program. There are probably very few parents who could not see the advantages of using audio-visual aids; but they cannot see these unless they are described and justified or demonstrated. They can be shown most convincingly by authoritative and competent discussions, exhibitions, and demonstrations.

Other responsibilities. There are other duties that the director may be called upon to perform, such as, for example, organizing, promoting, and conducting audio-visual conferences and workshops, giving lectures and demonstrations to outside faculties, community clubs, and other groups, serving on state and national committees, writing articles and reports, and so on. Incidentally, because his attendance at district, state, and national conventions and similar meetings should mean increased competency, he should be encouraged to attend these, preferably at school expense.

THE AUDIO-VISUAL CENTER

If the audio-visual center is to be a real center of audio-visual interests, policies, and activities, it must be suitably housed; hence one of the first duties of the director will be to work with the school administrator and the audio-visual committee in selecting appropriate rooms and properly equipping them. The place chosen should be centrally located, and whether a single room or several rooms, it should include sufficient space for (1) library, (2) previews and laboratory activities, (3) repairs and maintenance, and (4) storage.

In the smaller school systems or schools the audio-visual center may occupy a portion of the principal's office or a corner of the library. In fact, there is a definite trend in the direction of the latter arrangement, the library staff being responsible for checking equipment and materials in and out the same way in which it checks books. In such a setting student help can be used to good advantage in nearly all the activities suggested in this chapter—clerical work, distribution, maintenance, and in other ways assisting librarians and teachers.

Library. Because the library will play a very important part in this program, the materials selected for it should be chosen to meet the wide range of interests of the faculty.

Books. Books covering every phase of audio-visual education should be in this library. The following will indicate a minimum list. These have been selected from the bibliographies of the various chapters and are presented here in order to save the reader the trouble of hunting through these other lists for appropriate books. Of course, not all of the books on these other lists are included here.

Atyeo, H. C.: "The Excursion as a Teaching Technique," Teachers College, Columbia University, New York, 1939.

Dale, E.: "Audio-Visual Methods in Teaching," The Dryden Press, Inc., New York, 1946.

Dent, E. C.: "The Audio-visual Handbook" (rev. ed.), Society for Visual Education, Inc., Chicago, 1946.

Haas, K. B., and H. Q. Packer: "Preparation and Use of Visual Aids," Prentice-Hall, Inc., New York, 1946.

HOBAN, C. F., C. F. HOBAN, JR., and S. B. ZISMAN: "Visualizing the Curriculum," The Dryden Press, Inc., New York, 1946.

HOBAN, C. F., JR.: "Focus on Learning," American Council on Education, Washington, D.C., 1942.

LEVENSON, W.: "Teaching Through Radio," Rinehart & Company, Inc., New York, 1945.

McKOWN, H. C., and A. B. ROBERTS: "Audio-Visual Aids to Instruction" (rev. ed.), McGraw-Hill Book Company, Inc., New York, 1949.

MOORE, E. M.: "Youth in Museums," University of Pennsylvania Press, Philadelphia, 1941.

"The Principal and Audio-Visual Education," Department of Elementary School Principals, Washington, D.C., 1948.

Magazines and Bulletins. In addition to magazines and bulletins devoted exclusively to audio-visual instruction, those that carry special departments on the interests and activities of this field should be made available. A list of these will be found on p. 17.

Catalogues and Directories. Few school systems own sufficient materials to carry on a well-balanced audio-visual program. Consequently, it is necessary to rent materials such as slides, motion-picture films, transcriptions, and so on. Before these can be rented, their sources must be located and contacted, and thus the possession of catalogues and directories of these sources will be necessary. In addition to the numerous Federal and commercial agencies, many state departments—education, health, conservation, and so on—universities, and colleges operate libraries from which materials of various kinds may be borrowed. A shelf of catalogues and directories of these sources is indispensable.

Bulletin board. Most producers of audio-visual materials publish well-illustrated descriptive folders, and sometimes study guides and other instructional helps, which may be used to good advantage on the bulletin board. Such display will not only attract attention and help to increase interest but it will also serve as a means of keeping the faculty informed on new materials, equipment, and developments.

Display center. When working out projects, classes often prepare attractive materials—slides, pictures, models, graphs, maps, motion pictures, illustrated booklets, and so on—and an exhibition of these will motivate the students and teacher to a high quality of endeavor.

Card index. All materials owned, rented, and circulated by the department should be catalogued on a plan similar to the Dewey decimal system.[5] The use of such a plan will save instructors and students considerable time in locating the desired articles or in checking on materials and equipment available from the center. Too, such a plan will help to conserve the interest of these teachers and students. Inability to immediately locate needed materials will always be handicapping.

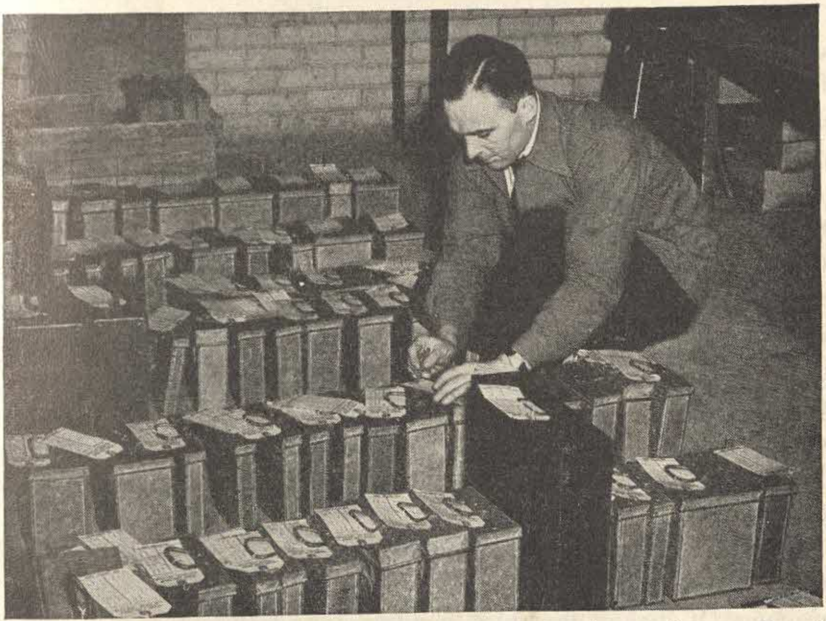

FIG. 6. Here a part of the daily shipment of motion-picture films to Detroit Public Schools is being given a final check against the orders received.

Some record must be kept of all equipment loaned—the item, date, name of teacher and school using it, date returnable, date returned, condition on return, and so on. Numbering each item will help to simplify this checking-out and checking-in process.

Evaluation index. Each instructor who uses a set of slides or pictures, a transcription, a motion picture, or other item, should fill out a simple evaluation or rating form. These forms should then be filed and made available to all teachers. Thus, when selecting an aid for use in a particular situation, the teacher can readily check on those available and note the evaluations by the teachers who have used it. Such a plan will be of value to the instructors in helping them to make an intelligent selection of materials. This evaluation index will also serve as a guide for the audio-visual director and committee in selecting materials to be purchased by the school. Probably the greatest usefulness of this system will be in connection with the grade placement of films.

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[5] Slides, filmstrips, records, and motion pictures are now classified by the Dewey decimal system.

Office. As considerable office space will be required for the handling of the details and records of the center, provision must be made for it and for the necessary equipment, desks, tables, chairs, racks, card catalogues, files, and telephones. Efficient administration can never be achieved in a crowded office.

Preview room. This room should be large and well equipped. All types of projector and record player should be set up and ready for use by either instructors or students. For previewing projected materials the use of small booths, shadow-box screens, or special previewing projectors will make it possible for several previews to be made at the same time. A qualified person should be on hand at all times to assist with the operation of the machines. He should, however, encourage teachers and students to operate them under his guidance. With such instruction the problems of operating equipment will soon cease to exist.

Workroom. Keeping the equipment and materials circulating from the audio-visual center in usable condition (a regular check on all machines is highly desirable) involves considerable time and work. A room should be provided where this repair and maintenance work can be done. This room should be equipped with the necessary work benches, tools, supplies, and repair parts. Equipment for conditioning and for rewinding and splicing films is essential, as is also storage space for repair parts. In some systems it may be desirable to provide equipment for making various kinds of handmade slide. Other equipment can be added as needed.

Storage room. Storage facilities are necessary not only to keep materials where they can be readily located, but also to keep them in the best possible condition, thus assuring maximal use. Most aids can be stored in almost any room. However, for motion pictures the room should not be too hot, and it should be located in such a way that the direct rays of the sun will not fall on the film containers.

Shelves, drawers, boxes, and other devices, suitably labeled, will help to provide efficient storage.

A reemphasis. One of the main purposes of discussing the development of any field of education is to suggest directions toward which this development should tend. Such standards may then be used practically in the evaluation of progress made toward them. The standards set in this chapter may be rather alarming to the novice in the field, the school administrator who is just beginning to plan a program, especially if he is employed in a single school or in a small school system. However, he should not be discouraged; instead he should be encouraged. This point is worth proving.

The many possibilities of the large systems have been emphasized here. This was necessary because these systems have more highly trained professional staffs, larger student bodies, more funds, greater possibilities for capitalizing local audio-visual opportunities, and so on. This does not mean that all audio-visual programs of larger schools are successful while those of small schools are unsuccessful. Far from it; often the opposite is true. Errors in planning and misuse in utilization are quite as possible in one setting as in the other. Mere size of pupil population, teaching staff, or number of buildings is not in, of, and by itself a safe criterion for the evaluation of the instructional activities of any system. But, in general, it is true that the practical opportunities of utilizing audio-visual aids are more numerous in the larger setting. Naturally, the more varied and complete program of a larger school system can be more easily adapted to the smaller system than can that of the smaller be arranged to fit the larger.

In general, as pointed out previously, the activities, materials, procedures, and problems in the use of audio-visual aids are almost the same in both systems irrespective of their relative size. Hence the many possibilities for wise imitation by the smaller school administrator should be enheartening, not disheartening.

A well-balanced audio-visual program is one that enriches the educational offering of every grade level and every subject. Such a program does not just grow up by itself; it must be carefully nurtured. To stress again the main theme of this chapter, it will not be built without competent builders. When considered from this point of view, the need for a capable director, an audio-visual committee, suitable equipment and materials, and adequate housing, irrespective of the size of the school, should be apparent. To provide less is to condemn this department to mediocrity or failure before it is even started.

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SOME PROBLEMS AND ANTICIPATIONS

A glance through this, or any other book of a similar nature, would undoubtedly amaze the uninitiated person—the one who may have heard about audio-visual instruction but who had never had either firsthand or secondhand experience with it. Frankly, a knowledge and an appreciation of the wide variety and the unlimited possibilities of the materials now available have amazed even the authors through the many months in which this volume has been in preparation, and both of these individuals have had some little theoretical and practical experience in educational matters. A great deal of progress has been made during the past fifteen or twenty years.

However, in concluding this discussion of what has been and is being done, it is also pertinent to indicate what yet remains to be accomplished. This is not done in any unappreciative or supercritical manner to discredit past achievements. Nor is it to repeat uselessly what has already been set forth in connection with all the aids discussed. Further, it is not designed to answer all the many questions that are still unanswered; such an attempt would be amateurish, to say the least. Rather, this presentation is for the purpose of emphasizing and thus focusing attention on a few of the most important problems that face the workers in this field.

Despite the progress that has been made since the first edition of this book was published, audio-visual education is still at the crossroads; the interest of producers, educators, and citizens has been aroused, and the vital question confronting the workers in the field is whether this interest will continue to develop in the direction of an intelligent and discriminating support of the program or whether it will gradually decrease as new educational movements and emphases appear. Proof and improvement are fundamental.

What developments lie ahead in audio-visual education? Although it is always hazardous to prophesy what will happen in a new field of endeavor, it is true that even a few years of experience do provide some basis for reasonable prediction. Education has had those few years of experience in this area. It is also true, as in any other pioneering adventure, that undoubtedly there is need for important developments in almost all phases of this activity.

One good method of helping to determine developments in a new movement is to note apparent weaknesses and dangers because it can usually be safely assumed that interested and intelligent workers in the field will endeavor to avoid these dangers and strengthen these weaknesses. A brief discussion of some of the most important of these dangers and weaknesses, which logically represent points at which attention and efforts should be and will be centered, will, consequently, provide natural settings for corresponding suggestions for improvement. Further, because this negative method of presentation is striking, it helps to emphasize the places of, and the necessity for, such betterment. Then in this section we shall base our predictions of future developments largely on what appear to be danger spots and weak spots in the present-day program. In the following section we shall list positively some additional anticipations.

DANGERS AND WEAKNESSES IN AUDIO-VISUAL EDUCATION

Not all of the following dangers and weaknesses are to be found in equal prominence in any one educational system, but probably, to some extent at least, all of them are to be found there. Hence, in the interest of an improved program, although it may be well for the reader to pay particular attention to those items which in his own setting are the most conspicuous, it is also advisable for him to give serious consideration to those which are less pronounced.

Several of these dangers and weaknesses have been mentioned at other places in this book, but they are included in order to summarize and to reemphasize their importance. In some instances they are mentioned again in order to indicate a different slant or a different method of approach to the solution of the problems involved.

Unclarified and unvalidated objectives. Obviously, any teaching device is used in order to accomplish certain educational objectives, and, just as obviously, such a device cannot be intelligently used until these specific objectives are known. In general, we know the objectives of particular fields of instruction, but we know less about the possible uses of aids in achieving these objectives. In audio-visual instruction, as in other educational fields of somewhat recent development such as guidance, measurement, and activities, educators have been anxious to put the devices into actual and immediate use, and they have not given sufficient serious consideration to the basic philosophy and psychology underlying the utilization of these devices; as Dale aptly expresses it, they have "poked the fire from the top." Complete and completely truthful answers have not been given to all the whats, wheres, whens, hows, and whys of these aids. Specifically, in what ways, to what extent, and under what conditions do these aids affect attitudes, contribute knowledge, teach intelligent discussion and reflective thinking, bring inspiration, and motivate learning? These questions must be answered authoritatively.

A great many claims, probably most of them more or less apparently logical, and some of them at least somewhat well justified scientifically, have been made. Considerable research has been undertaken in this field of education, and a great deal of investigation is now being carried on in all parts of the country. This serious and intelligent attention is bringing very near the day when this general field will be completely accepted and fully accredited by educators, manufacturers, and citizens. But there are still things to be done. There must be helpful cooperation between producers and educators. This problem represents another demand for an enlightened and vigorous leadership.

Unsympathetic or incompetent administrators. The literature of audio-visual education is full of references to the administrator—superintendent or principal—as the "key man," "bottleneck," "top brass," and other expressions which indicate that he is considered by these writers to be the most important single individual in the school system. Undoubtedly, this is true. He is the superior part of a recognized superior-inferior relationship and as such naturally carries the greatest weight. If he fails to appreciate the place and value of audio-visual aids in true relationship to educational objectives, curricular materials, and teaching techniques or if he cannot find the money with which to finance such a program or if for other reasons he is not or cannot be sympathetic with the program, his attitude will chill the interest of his teachers and handicap wholesome development.

Perhaps one should not be too hard on such a person. After all, he is only an employee of the system the same as the teachers, and as such must take orders, implied or expressed, just the same as they do. As a matter of fact the successful school administrator is a man of unusual qualities. He is a politician who keeps on good terms with influential families, parties, or organizations; he is a financial wizard who stretches inadequate financial support to cover more than it was originally intended to cover; and he is an educational expert, a personnel worker, and a general all-around promoter. Because everything he says and does jeopardizes his own future, he has to be somewhat cautious. He well knows that attempting to stampede his community, board, or staff into an immediate and wholehearted acceptance of a new educational plan or procedure would be disastrous.

Further, while the teacher has direct responsibility for educating one group—her pupils—and indirectly her associated faculty members (including the administrator), the administrator has direct responsibility for educating three groups, in addition to, indirectly, a fourth, the pupils. He must educate his board, his community, and his faculty. No program of school improvement will be effectual unless and until all three of these groups have been "brought along." Because the implications here are important, a brief discussion of each of these responsibilities is imperative.

The board of education. Theoretically, the board of education represents the community's wishes in school affairs. However, because (1) these wishes may not be particularly adequate, due to the educational incompetency of the average citizen, and (2) the board usually has had considerable experience in educational matters, this board is in a better position to give more or less expert attention. Of course, it is true that some members of almost any board feel that their main job is to see that school expenses are kept down, and thus they pride themselves on being "watchdogs of the treasury." It is also true that, although the community pays for the school, the board names the price.

Board members are generally highly respected citizens and due to their standing and also to their numerous contacts, they can and do have a great deal of influence on the community's educational thought and practice. However, often some of these members are out of touch with modern educational ideals and methods, and they fail to see the place or value of "newfangled ideas." Undoubtedly, George Bernard Shaw was thinking of these when he said, "Education is always driving the tacks where the carpet was two weeks ago!" Some board members may have little respect for the superintendent's position and consider its occupant pretty much as an executive secretary, a sort of high-salaried office boy. More intelligent members consider him a professional, whose job it is to lead the board in wise educational procedures.

Naturally, a serious-minded board member is willing to learn more about his job, realizing that materials and procedures change in education just the same as they change in his own profession or business. Therefore, one of the main responsibilities of the administrator is to ensure that the board takes a tolerant attitude toward the new and acts with discrimination. No matter how wise, logical, or enthusiastic the administrator may be on a certain matter, unless he is able to convince the board of the worth of his ideas, for all practical purposes he might just as well not have these ideas.

The community. Although it is organized and administered by a board of education and professional staff, basically, the school is of, by, and for the community. The community pays the bills. What the community wants, be it a new building, a grade reorganization, a successful basketball team, a uniformed band, or a program of audio-visual education, that the community will get. Obviously, enlightenment that brings intelligent community interest and demand is fundamental.

It sometimes happens that a community leaves educational matters entirely in the hands of the board and its administrative staff and does not bother itself much about what happens. Many and many a community has, after such a sleep, awakened to the fact that its school is largely obsolete. The usual housecleaning of board and administration comes as a result, all because these hid the school behind an "iron curtain." In such a case the community is to some extent to blame, but mostly the educational heads of the system are at fault.

Generally, community demands for a "modern" school system are met with a new building, a large stadium, spectacular public activities such as graduation programs and pageants, success in contests and competitions, and, of course, all forms of publicity-getting athletic teams. These are the easily seen externals of the system, the outside of the school. Many an administrator builds his reputation on this outside. The inside of the school—purposes, personnel, techniques, materials, organization, scholastic success, and so on, is less spectacular, less easily seen, and consequently less demanded by the average citizen of the community, the individual who himself did not complete high school.[1]

The discerning administrator, be he in a large or in a small system, devotes a considerable share of his time to the educating of his community, in order that improved opportunities will result. He does not do this by means of the "hoopla" of the political orator; he does it with facts, figures, and logic presented through such mediums as community meetings, newspaper,[2] reports and other publications, demonstrations and exhibitions, drives and campaigns on a high level, and in other ways. In the case of audio-visual education, instead of "whooping it up" about "being modern," he shows how the use of these materials and techniques, in addition to being good educational investments, is also in the long run a good financial investment because through improved teaching comes a reduction in failures, repeaters, disciplinary troubles, and so on. In these days of increased expenditures for both old and new educational purposes, activities, and equipment, antiquated tax systems, and less dollar value, such talk counts with the average citizen.

In a word, a program of audio-visual education costs money, and financial support will never come until the community is "sold" enough on it to be willing to pay for it. The administrator must do this selling.[3]

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[1] According to recent figures, out of 76 million adults in the United States, 2 million are college graduates, 10 million are high-school graduates, 32 million completed only the elementary school, and 32 million did not complete the elementary school.

[2] Probably the newspaper editor is next in importance to the superintendent. At least he has direct contact with almost every family in the community. His personal and professional friendship is of immense significance to any school administrator.

[3] *Public Relations in Secondary Schools* is the title of a bulletin, vol. 32, no. 152, February, 1948, of the National Association of Secondary School Principals. Parts III, IV, and V (185 pp.) are composed of descriptions of activities, procedures, and practices by means of which communities are officially acquainted with their schools. Many of these articles describe the ways in which audio-visual aids are utilized in this program of intelligent publicity. See also K. Trenholme, Visualizing the Annual School Report, *See & Hear*, vol. 1, pp. 82–86, December, 1945. The theme of this article is "illustrated versus vital statistics."

Incidentally, the audio-visual program promises a wholesome development in another beneficial form of community education—that of promoting cooperative and cordial attitudes toward school functions, activities, and personnel by centering attention on, and giving assistance in, the solving of the many problems of childhood—diet, sleep, regularity of hours, recreations, dress, discipline, and many other habits and relationships that directly influence the school life of the child. Parental responsibility will be stressed, and parents will be shown how this responsibility can be best met. The use of such devices as motion pictures, slides, and similar projections, newspaper and other reports illustrated with graphs, charts, and drawings, posters, visits, broadcasts, dramatic, music, and other programs, exhibits and demonstrations will help to improve these important school-community relationships.

The professional staff. Without a cooperating staff, an agreeable board and a willing community are ineffective. Unless the administrator is able to sell his ideas and ideals to his teachers, again for all practical purposes, he might just as well not have them. Of course, because of his position as the superior, it is possible for him to bludgeon a program of audio-visual education across to his teachers, but the resultant "support" will never be vital, functional, or enthusiastic. In order to achieve a healthy cooperation, he will have to sell his program to his teachers on the basis of value; he can never achieve this intelligent support if his appeal is on the basis of loyalty to a superior officer. As has been suggested previously, he can win this cooperation in a number of ways, by meetings, conferences, reports, visits, demonstrations, researches, workshops, extension courses, summer courses, short courses, and other activities in which the teachers participate; and by providing easily for teacher needs—time, materials, equipment, and expert assistance. A tolerant attitude toward mistakes and shortcomings will also help.

Unsympathetic teachers. It is worth reemphasizing that teacher sympathy with the audio-visual idea is essential to the program's success and also that it is just not reasonable to expect her to attain this attitude without an appropriate cultivation and nurture of it. Probably the two most important reasons for this lack of sympathy are (1) a reluctance to discard known materials and procedures for unknown and (2) a fear of additional work or difficulties.

The average experienced teacher has learned to do her job in a certain way and is probably at least fairly successful in it. Because of this success she has confidence in her methods and in herself. Now when some new idea such as audio-visual education comes along she is reluctant to risk her reputation by changing from known and established materials and procedures to those which are unestablished and unknown.

Another teacher may be semisympathetic, sympathetic in theory but unsympathetic in practice. She may appreciate audio-visual possibilities but at the same time would rather have someone else try these out first. Often she may actually anticipate using these devices herself after "the bugs have been worked out" by someone else.

Although traditions, apathy, and conservatism hinder progress, we should not blame these two teachers too severely. Progress always comes slowly, and caution is one of the signs of intelligence. However, such teachers should be led to realize the wisdom of the ancient saying, "Not only is he idle who does nothing but also he who might be better employed." A classroom procedure that to all intents and purposes appears to be successful may be, relatively, a failure. It is, of course, if some other procedure would be more successful. Further, it should be stressed that audio-visual instruction does not mean a complete elimination of all materials and methods traditionally used. Assignments, textbook lessons, recitations, special reports, and examinations will always be important parts of classroom exercises. Audio-visual aids will help to make these more meaningful and effectual. Supplementation instead of substitution should be emphasized in this program of teacher education.

A third teacher may be fearful that audio-visual education will mean additional work, difficulty, or mental discomfort. It may mean these, probably will, until she masters the new materials and procedures and gains confidence in using them. Even then, because of the improvement of older aids and the invention of newer ones, she will, in reality, to some extent face the necessity of continuous readjustments. Making the teacher's work easier is by no means an objective of audio-visual education.

This teacher should be taught to appreciate that audio-visual instruction will help to make her teaching a more exciting adventure and that new and additional tools will bring a freshness and variety never to be found in the dull monotony of traditional lesson assigning and hearing.

Pupil interest, as well as her own, will be increased by the novelty of the newer devices and methods and their possibilities of manipulation and application. Freedom from the deadening routine of prescribed methods will bring her a feeling of independence. The opportunities for the exercise of her own ingenuity and originality will bring a challenge and a self-respect that will encourage and even thrill her. With her increased success and corresponding professional growth will come an increased personal satisfaction and enjoyment.

Starting too ambitiously. A very common cause of failure in almost any line of work is a too ambitious start. It is understandable that, when a staff has become converted to the theory of audio-visual activities, it should want to make an auspicious beginning; but it must keep in mind that an auspicious beginning does not necessarily mean an auspicious ending. Often it may mean a very unauspicious ending. How the program is initiated is important, but how the program continues is far more important. Naturally, mistakes will result from inexperience and lack of skill, but with a modest beginning these will be fewer and smaller. To "start small and grow big" is much better than to "start big and grow small." A gradual growth toward reasonable goals is desirable.

Educators often have been quick to promote some new idea, theory, or practice in their schools without taking time to adequately prepare their teachers for it. How often has this actually happened in American schools: a principal or superintendent hears about some new educational idea or procedure, is immediately intrigued by it, rushes back to his school and literally dumps it into the lap of his faculty with a high-pressure order and a justification of the "This-is-all-the-rage-now-in-modern-education-so-let's-be-up-to-date-and-do-it" type. His teachers, honest and sincere, but without previous training or adequate time for study and preparation, attempt to "do it" with results that are usually tragic, not only temporarily in the failure of the particular project, but also more than temporarily in the attitudes developed by these teachers—attitudes that find expression in the oft-heard statement, "We tried that, and it didn't work; it may be all right in theory, but it won't work in practice." Proofs of these tragedies are evident in many schools; they are to be found in the long list of student council and homeroom failures; in the stacks of given, scored, and publicized, but practically unused, tests and measurements; in the volumes of justifiable and recommended, but unincorporated, curriculum revisions, and in other similar failures.

Intelligent educational leadership avoids these tragedies, or most of them, by encouraging serious, painstaking study, allowing time, and by promoting smaller attempts first—tryouts and experiments. The sagacious educator realizes that the education of the teacher, like the education of the pupil, is a rather slow process, and in his policy planning he makes appropriate provision for this.

Further, he is not disheartened by the cry of "fads and frills" commonly raised when any new educational idea is proposed. He knows that, although not all change represents progress, at the same time there is no progress without change. He knows that every subject in the school, except the "three R's" was designated a "fad" and a "frill" when it was first suggested. He knows that the "fads and frills" of today are often the essentials of tomorrow. Here again, he must prove this point to his faculty, board, and community. This takes time.

Undiscriminating imitation. It has already been suggested that a wise and discriminating adaptation of the audio-visual program of another school is desirable and beneficial while a blind and slavish copying of that program is entirely undesirable and detrimental. This point cannot be overemphasized. In any new field there may be more of the second kind of imitation than of the first. Often a lack of experience, background, general ability, and time tend to encourage indiscriminate imitation. The general attitude that "all schools are schools" and "all pupils are pupils" and hence a program that is successful in one setting will be equally successful in another is ridiculous because no two schools of a particular size and type and no two pupils of the same age and in the same grade level are alike. There will be significant dissimilarities, and these must be seriously considered in developing a program that will fit the local setting. This program *must* fit if it is to be effective and successful.

Formalization. In the utilization of nearly all audio-visual aids there is a certain informality or looseness that is rarely permitted in the traditional forms of classroom work. Without a doubt some of this informality or looseness represents a waste. However, at the present time teachers, supervisors, and producers are attempting to reduce this waste as much as possible by means of definitely organized accompanying lesson plans, which include outlines, questions, assignments, suggestions, examinations, and so on. These helps should be of great value to both teachers and pupils, especially to those teachers who are untrained and inexperienced in the field—probably 80 per cent of our total teaching force. These lesson helps represent a justifiable and honest attempt to make the aids pay high educational dividends.

However, it is conceivable that this formalization can be carried too far. For example, it is entirely possible for the use of a film or model or picture to become too routinized, and thus, as the focal point of the lesson, the aid becomes dry and unintriguing to the pupil, thus defeating the very purpose for which it is designed. If regularity of routine, dearly beloved by teachers and administrators, becomes established in the use of aids, these will lose their effectiveness and cease to be aids. Just where the point is at which the use of aids becomes too formalized no one at present knows. Ultimately, experience will help us to locate it. Meanwhile, it is well to recognize and remember that there is such a point.

Informalization. This possibility of weakness is the opposite of that discussed above. Because of the relative informality of the aids-lesson, as contrasted with the formality of the usual recitation, there is a very real danger that the pupil will fail to realize that this lesson, like any other, is designed for very serious and vital purposes. It has been repeatedly emphasized in this book that teaching with aids does not in any sense represent "soft pedagogy," entertainment, or fun, and the pupil himself must appreciate this.

The second point is worth stressing. The pupil must be taught that the school is giving him a new tool by means of which he can do his schoolwork more efficiently, but that this in no way decreases or eliminates his own responsibility. He himself will still be held accountable for results. Further, although her relationships may be a bit more friendly, sympathetic, and personal than in the traditional classroom exercise, the teacher is in no way relinquishing her place as a dignified and exacting instructor.

Lack of suitable housing. At the present time a lack of adequate housing is a severe handicap to the audio-visual program. Although some forms of aids are satisfactorily housed, others are not, especially those which have appeared since the present buildings were erected. A few examples will illustrate.

In many a school now, when a film is to be shown, there is a scurrying around to locate a room which will accommodate the group, a rearrangement of conflicting classes, a hurried and usually not too successful attempt to cover the windows, and a removal or readjustment of interfering classroom paraphernalia. Needless to state, in such a setting the showing of the film is certain to be relatively ineffective.

Recently one of the writers was present at a class session that was utilizing a music-program broadcast. The setting was the chemistry laboratory. The students sat on high, uncomfortable stools, peeked through rows of bottles, and made faces over the numerous odors present. At the beginning of the period the students apparently tried honestly to overcome these distractions, but after a few minutes practically the entire group surrendered to them. Very little was accomplished after the first 10 minutes of the program. Upon later inquiry it was learned that there was "a good radio in this room, too large to be moved easily, and anyway no other room was available for the period." Because the setting was not propitious, this lesson represented wasted time and effort.

Possibly the reader has seen such pictures as these: pupils crowding around a desk, those at the rear shoving and standing on tiptoes, trying to get a look at a model or object; pupils working at their piled-up desks, looking at a picture, then holding it off in one hand while attempting to write out an answer or make notes with the other; pupils crowded two in a seat, and others standing about the room during a motion picture, projection, or recorded playback.

Some aids can be used effectively in the regular classroom while others require especially designed settings equipped with proper seats, display racks, worktables, shelves, filing cabinets, and storage space. Undoubtedly, these more-conducive-to-learning provisions will come with new buildings. In the interest of a successful program, they must come.

Failure to capitalize local opportunities. Purchased materials are important because they (1) represent professional competency, (2) bring reflections of times, places, events, and things of world-wide importance that could rarely or never be satisfactorily obtained in any other way, and (3) add a certain caliber and dignity to the program. These professionally produced aids have been developed in great quantity and variety, and surely there will be a still greater development of them in the years to come.

However, there are many possibilities of local production, development, and use which should be capitalized. To illustrate: in Chap. 11 there are indicated numerous places in the average community which may be visited with educational profit. Many of these issue booklets, reports, pictures, slides, maps, models, and other forms of aid that can be collected and used to good advantage. Wider school use of these will encourage the still greater production of them. Increasingly, cities and states are producing usable materials on parks, rivers, scenic and historical spots, occupations, natural resources, and so on, most of which can be obtained free or by the payment of transportation expense only. These, too, should be collected, classified, and utilized.

In addition to this local material from more or less professional minds and hands, there are numerous possibilities of production by students, teachers, student-teacher committees, teacher committees, and so on, often in collaboration with interested outsiders, photographers, naturalists, historians, musicians, and other hobbyists and enthusiasts. The sources and the help are waiting to be capitalized. Of course, any such local production should be on the basis of educational profit for the participants and later users, and not on the basis of financial economy. As yet, with the exception of trips, comparatively little has been done to give these local educational possibilities the consideration they deserve.

Lack of cooperation between theorizers and practicers. The present interest in the field of audio-visual instruction is due to two groups of enthusiasts, the "knowns," who through publication and promotional activities have furthered its development, and the "unknowns"—the teachers, administrators, and other actual users whose efforts have been made on the firing line. The work of these two groups, which may be designated roughly as the theorizers and the practicers, has been complementary. The "knowns" have encouraged, assisted, and publicized the "unknowns," and these have supplied ideas, plans, and materials from their firsthand experience.

A number of books and many articles have been written, quite a few teachers' college courses have been offered,[4] materials have been produced and distributed, curricula have been revised, associations have been formed, and meetings without number have been held. But there is still room for improvement. What is needed is a still greater coordination of all of these forces—an organized and concerted demand for seriously thought-out and carefully planned training schedules that will not only prepare intelligent leadership in teachers, supervisors, and directors but also dignify the field, give it caliber and importance, and thus bring it up to a par with such other well-established fields as guidance, curriculum construction, and measurement. The development of a strong, central, national promotional organization must not be allowed to lag.

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[4] These courses were offered in 303 colleges and universities during the summer of 1947.

There must be a coordination of the efforts of all the promoters of audio-visual instruction. Scattered and unorganized efforts are never so effective as concerted action. As was indicated in Chap. 1, there are, at the present time, a considerable number of institutions, organizations, and offices that are actively interested in this field. Among these are the Department of Audio-Visual Instruction of the National Education Association, governmental and state departments, divisions, bureaus, and offices, state and local educational associations and bodies, public and private loan services of all kinds, universities, colleges, and similar institutions, foundations, and commercial enterprises. These should be organized into some strong body or office for the purposes of (1) assembling, classifying, cataloguing, and publicizing materials; (2) encouraging investigation, experimentation, and research for the evaluation and validating of equipment, materials, and techniques; and (3) promoting meetings, conferences, forums, clinics, and close-by demonstrations—all for the general ultimate purpose of stimulating the systematic production, distribution, and the effective utilization of these aids.

As has been implied repeatedly before, this promotional work should not be something set apart from the other educational fields—curricular, administrative, measurement, guidance; it must be coordinated with each and all of these. To emphasize again, audio-visual aids are complementary, not substitutionary. Any attempt by audio-visual instruction enthusiasts to dominate these other fields will be met with perfectly proper resentment and opposition by the workers in these fields.

Lack of close cooperation between producers and educators. Although there has been a commendable coordination of efforts of educators and producers of certain types of devices such as, for instance, maps, it is well known that in other instances this cooperation until very recently has been slow to develop. Both groups have been responsible.

To illustrate with motion pictures: despite recent improvement (1) some producers still have difficulty in distinguishing between education and entertainment; (2) in casting about for other possible fields, the producers, with their exceedingly limited educational insight and background, have produced "educational" pictures that are weak; (3) these productions have been stupidly promoted (by both manufacturer and distributor) with the sales methods and the usual spectacular exaggeration—commonly designated, but terribly mislabeled, "advertising"—used in connection with theatrical films; (4) some producers have neglected the educational field—church and school—fearing that production in this would adversely affect their major interest—theatrical films; and (5) they have been so much interested in the large and immediate profits common in their theatrical ventures that they have not seen fit to give serious attention to the educational field in which quantity production was not demanded and in which, as a result, film costs have been inordinately high. In this, of course, the producers were inconsistent; they would gamble a million dollars on a "stupendous," "gigantic," and "colossal" spectacle, salable at best for only a few months, but would not invest a hundredth part of this amount in an educational adventure, a film that could be used for several years.

Similarly, educators have been somewhat slow to appreciate the possibilities of the motion picture because (1) they realized the differences between devices of entertainment and devices of education and tended to classify the film in the former group; (2) they quickly recognized the inaccuracies and misemphases—the weaknesses—of the films produced; (3) they were nauseated by the inane and cheap "advertising" used; (4) they resented the sales methods employed; and (5) perhaps a few even feared "robot instruction" would, to some extent, replace them. Hence it was somewhat natural that some educators should oppose the motion picture or, in case of pressure, accept it halfheartedly.

Of course, these descriptions of the attitudes and activities of producers and educators are not accurate in many instances. There have been a number of outstanding farsighted producers who recognized the potentialities of the educational field and who, at considerable expense, attempted to develop it; and, likewise, there have been many fine farsighted educators who recognized these possibilities and worked to capitalize on them. In general, the attitudes of both groups have greatly improved during the past two or three years.

It is trite to remark that both these groups—educators and producers—should pool their resources and cooperate wholeheartedly. In the first place, this means that the educators for whom the films are produced should have a major part of the responsibility for determining their general form and content. Naturally, they cannot have this until the producers recognize and accept this point of view, understand and appreciate instructional (as distinguished from entertainmental) needs, and respect the educators professionally. This confidence of the producers in the educators must be based not only upon an appreciation of them as experts in instruction but also upon a recognition that the strictly educational field does offer opportunity for financial dividends, especially when a long-term program is considered.

In the second place, this cooperation means that the educators appreciate the point of view of the producers, know something about the problems of production and distribution, and recognize the logic of a fair financial profit. It means that the educators must prove their case—conduct surveys, investigations, and researches that will result in definitely justified and validated requests for material. Producers often make the statement, "Teachers don't know what they want; when they decide and tell us, we'll provide the material." Undoubtedly, too, they are right. This responsibility is the educators'. Here again, considerable progress is now being made toward the achievement of this educator-producer cooperation.

Because of the newness of the field, it is only reasonable that both groups realize the many possibilities of error, misemphasis, and misunderstanding and thus be mutually tolerant of each other's shortcomings. An attitude of "we-are-well-established-and-we-make-no-mistakes" on the part of either group will, of course, seriously handicap the building up of cordial and helpful relations.

To some extent what has been said concerning motion pictures is just as applicable in the case of nearly all the other aids discussed in this book—photographs, prints, stereographs, glass slides, filmstrips, charts, textbook illustrations, specimens, objects, models, radio programs. In connection with some of these aids, due to their comparatively low cost and the fact that they have been used in the schools for a long time and hence are somewhat "mature" in development, much of this producer-educator cooperation has already been accomplished. However, in order to provide the necessary improvement and changes, even in these instances, there must continue to be an intelligent coordination of efforts.

The need for a strong, central promotional organization is quite evident. A competent, representative, and officially authorized advisory committee could collect, collate, and prepare the requests of teachers, supervisors, administrators, and scientific investigators and present these to a similarly representative, competent, and officially authorized committee of producers. Out of this permanent setting of two mutually respectful groups would undoubtedly come the kinds of aid that the schools need. Because of its permanency, this combined group could continuously promote the improvement of equipment, materials, and techniques and thus encourage uninterrupted progress in this field.

A schoolhousebound conception of education. For centuries school and schoolhouse have been considered largely synonymous. Even today there is a widespread feeling among parents and patrons—and teachers—that educational activities which are carried on away from this setting smack of entertainment and recreation. This attitude is but natural because for all these centuries the formally organized and rigidly scheduled activities of education have been centered in the schoolhouse. Hence today the audio-visual program faces some opposition because several of its devices realistically reflect, through first-hand experience, the outside community.

A program of enlightenment for adults, showing the modern trend away from scholarship and toward citizenship as the main educational goal, plus concrete evidence that actual contacts with life settings, people, and things are more functional than academic book learnings about them, should be considered an important part of the campaign for the development of a favorable attitude toward unschoolhousing education. Probably the schoolhouse will never be replaced as the educational center of the community, but it will be supplemented by additional settings if determined efforts are made to justify these rearrangements. Perhaps this will not be too difficult because the average parent and patron—and teacher—should be able to appreciate the necessity for a closer articulation of the school with the community, its industries, stores, shops, offices, religious, educational, and recreational facilities and other interests, activities, and services.

SOME ADDITIONAL ANTICIPATIONS

In addition to the developments suggested in the previous pages, during the next few years we may expect to see the following: [5]

1. A great increase in the number of schools developing their own library of audio-visual materials and equipment, both by themselves and in collaboration with other schools; the promotion of county libraries for rural schools, sources that will loan the more expensive equipment such as projectors, as well as materials and supplies. This development is now well under way.

2. More extensive and more closely related and integrated use of aids in connection with subjects, courses, topics, and textbooks and with each other.

3. Better aids, due to improved engineering, manufacturing, and distributing.

4. The greater development by producers of services that will help teachers and committees to a better utilization of materials and equipment; not only handbooks and instruction books illustrating successful procedures and techniques but also immediate and direct in-school assistance. Several companies now employ experienced educational consultants and staffs for this work. These excellent examples will undoubtedly be followed by other producers who recognize the value of this competent service.

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[5] "Audio-Visual Program Standards" is the title of a very carefully prepared set of criteria recommended by the National Committee of Fourteen. It covers all phases of the audio-visual program and can be used as a sort of survey instrument by which a school can rate its own programs. This article will be found in *See & Hear*, October to December, 1947, and January, 1948.

5. Increased audio-visual certification requirements for teachers. Greatly improved teacher training for both those who are preparing to teach and those who are already employed.

6. A greatly increased utilization of trips, with a considerable emphasis upon longer air-travel, national and international tours. The fast-growing practice of teacher and student exchanges will help to develop this larger program.

7. Improved relationships with community trip objectives and more definitely organized plans and materials provided by these objectives—suggestions for preparation, visiting, and capitalization.

8. Development of newer types of aid—wire and tape recording and playback machines, FM radio, and television—with appropriate plans for their use.

9. Better organized and more vigorous leadership and promotion by state boards and offices of education.

10. Greater research and experimentation by both educators and producers leading to better evaluation, not only concerning the various aids in connection with particular subjects and classes, but also concerning the relative values of different aids in these settings.

AND OUR RESPONSIBILITY?

Much has already been done in the field of audio-visual instruction, and judging by the extent and the seriousness of the present efforts in the field, much more will be accomplished in the next few years. This field, as at present emphasized and organized, represents a new and powerful movement in education, and as in any pioneering work, misemphases and mistakes are inevitable. However, these misemphases and mistakes, like those in any other activity, really represent failures only if they are not properly recognized, avoided, and hence ultimately overcome. Incidentally, one reason why the movement is intriguing is that it is new. A field that offered no problems to solve and no opportunities for procedures to be developed or material to be originated—one that offered no challenges—would be uninteresting to an ambitious and farsighted teacher or administrator.

In conclusion, it is pertinent to point out that educators and producers who recognize the opportunities in this field must accept full responsibility for its ultimate success or failure. Following his investigation, L. H. Chapman states, "The results obtained make it evident that the program of visual education must be systematized and stirred out of its present lethargy. This falls of necessity on the administrators."[6] Although this statement was made nearly a decade ago it is as pertinent now as it was then. Certainly it is not to the credit of the "insiders"—those who are acquainted with the field and who believe in it—to have "outsiders"—those who lack the appropriate background of information, ideals, and ideas—point out flaws and weaknesses that they should have noted first. In short, those of us who appreciate the many excellent opportunities in the field of audio-visual education should be at one and the same time its most severe, and its most intelligent, critics.

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CLARK, E. C.: The Open-house Exhibit as a Stimulus to Interest in Visual Instruction, *Educational Screen*, vol. 16, pp. 87–88, March, 1937.

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DENT, E. C.: The Audio-visual Aids of Tomorrow, *Music Educators Journal*, vol. XXXIII, pp. 22–23, 38, April, 1947.

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ELLIOTT, G. M.: What Do High Schools Want in Films? *Secondary Education*, vol. 9, pp. 21–23, January, 1940.

JETT, E. K.: Why Better Radio Programs Are Coming, *Film and Radio Guide*, vol. 12, pp. 16–17, April, 1946.

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[6] What I Expect of Administrators, *Educational Screen*, vol. 18, pp. 328, 342–343, November, 1939.

Johnson, E.: Advances in the Use of Films as Visual Aids, *Film and Radio Guide*, vol. 12, pp. 36–38, May, 1946.

Krug, W H.: Another School Starts from Scratch, *Educational Screen*, vol. 25, pp. 563–564, December, 1946.

Kruse, W. F.: Engineering Progress Opens New Vistas, *Educational Screen*, vol. 26, pp. 262–264, 284, May, 1947.

Lewin, W.: Film and Radio Standards, *Film and Radio Guide*, vol. 13, pp. 5–9, April, 1947.

Lumsdaine, A. A.: Experimental Research and the Improvement of Teaching Films, *Educational Screen*, vol. 26, pp. 254–255, May, 1947.

McCafferty, R.: Developing Visual Materials for Classroom Use, *Journal of the National Education Association*, vol. 35, pp. 521–522, November, 1946.

Mason, E. W.: A. High School Uses the Community, *Educational Method*, vol. XX, pp. 244–250, February, 1941.

Moore, E. M.: "Youth in Museums," Chap. IX, University of Pennsylvania Press, Philadelphia, 1941.

Reed, P. C.: The Curriculum Clinic—A Neglected Area, *Educational Screen*, vol. 25, pp. 367–368, September, 1946.

Roberts, A. B.: Audio-visual Aids in the Schools of Tomorrow, *Educational Screen*, vol. 23, pp. 9–10, 18, January, 1944.

Stenius, A.: Where Do We Go From Here? *See & Hear*, vol. 1, pp. 74–77, November, 1945.

Tabler, C. H.: The Next Decade of Audio-visual Use, *See & Hear*, vol. 3, pp. 13–20, December, 1947, January, 1948.

Trends in Visual Education number (13 articles), *Visual Review*, 1946.

Where Are We Headed in Visual Instruction? (panel discussion), *Educational Screen*, vol. 19, pp. 155, 179, April, 1940.

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SOURCES OF MATERIALS AND EQUIPMENT

This section of the book was designed to meet the needs of teachers and administrators who are using, or plan to use, the various types of audio-visual aid described or reflected in the previous pages. Although, naturally, this list of sources is not complete, enough has been included to assist in the obtaining of almost any kind of equipment and material required.

In addition to the sources listed below, loan exhibits and services and descriptive lists of sources are available through many Federal and state departments, university extension divisions, and national, state, and local museums of art, science, and industry.

In general, materials from industrial and commercial firms are free for the asking. However, occasionally a small charge is made. Although, in the case of purchasable materials and equipment, an examination and comparison of the catalogue descriptions of these may not represent conclusive evidence of relative values, such an examination and comparison will at least be educative. In fact, one way to stay informed on the developments in the various fields is to obtain and study the most recent catalogues of producing and distributing firms.[1]

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[1] A good list of sources—governmental, professional, and noncommercial—with publications and visual materials tabulated, will be found under the title, Teaching Aids for Teachers, by M. D. Davis and G. Stark, in *School Life*, vol. 8, pp. 25–31, April, 1946. See also the various lists of sources (slides, filmstrips, equipment, films, and so on) published frequently by the Division of Audio-Visual Instructional Service of the National Education Association, 1201 Sixteenth St., Washington 6, D.C.; "Pamphlet 80," U.S. Office of Education, Washington, D.C., 1940; and J. P. Kishler, "Sources of Information on Teaching Aids," a 10-page pamphlet issued by Visual Aids Consultants, 47 W. 56th St., New York. Lower grade teachers will find Chap. VIII of "Social Education for Young Children in the Kindergarten and Primary Grades," M. Willcockson, ed., of value. It was published in 1946 by the National Council for the Social Studies, Washington 6, D.C. A good bibliography for elementary school teachers is Constance Weinman, "Bibliography on Audio-Visual Instructional Materials for Teachers in the Ele-

AUDIO-VISUAL PERIODICALS [2]

Audio-Visual Guide, Educational and Recreational Guides, Inc., 172 Renner St., Newark, N.J.

Business Screen, Business Screen Magazines, Inc., 157 E. Erie St., Chicago.

Eastman Kodak News, Eastman Kodak Company, Rochester, N.Y.

Educational Screen, The Educational Screen, Inc., 64 E. Lake St., Chicago.

Film News, The Penthouse, 15 W. 38th St., New York 18.

Film World, Ver Halen Publications, 6060 Sunset Blvd., Los Angeles, Calif.

Journal of the AER, Association for Education by Radio, 228 N. La Salle St., Chicago 1.

News Letter, Bureau of Educational Research, Ohio State University, Columbus, Ohio.

School Films (quarterly), Ver Halen Publications, 6060 Sunset Blvd., Los Angeles, Calif.

See & Hear, Hale Publishing Company, Eau Claire, Wis.

Televiser, Television Publications, 11 W. 42nd St., New York.

The 16 Millimeter Reporter & Factual Film Week, 545 Fifth Ave., New York, N.Y.

Visual Review (annual), Society for Visual Education, Inc., 100 E. Ohio St., Chicago.

INDUSTRIAL AND COMMERCIAL OBJECTS, SPECIMENS, MODELS, EXHIBITS, BOOKLETS, PAMPHLETS, POSTERS, AND CHARTS

Food Products

American Sugar Refining Company, Dept. M, 120 Wall St., New York 5. Exhibit and booklet, "The Story of Cane Sugar."

Armour and Company, Chicago 9. Booklets on meat industry. Food source map.

Borden Company, Consumer Services, 350 Madison Ave., New York 17. "Modern Milk Magic," "What Does Your Smile Show?" "Milk Goes to Town," and other illustrated booklets; charts.

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mentary School," Teachers College, Columbia University, New York, 1947. "Elementary Teachers Guide to Free Curriculum Materials," by J. G. Fowlkes and D. A. Morgan, is published by Educators Progress Service, Randolph, Wis., 1948. The Library Visual Aids Service, New Jersey State Teachers College, Upper Montclair, N.J., issues excellent source lists of material appropriate for the teaching of specific subjects, also "Free Teaching Aids from A to Z," an inexpensive mimeographed booklet containing more than 500 addresses.

The most complete list of sources of free materials is "The Educator's Directory," a booklet containing about 3,000 items, published by the Continental Press, Harrisburg, Pa.

[2] A number of other professional magazines include sections or departments devoted to this general field.

California Fruit Growers Exchange, Educational Division, Sunkist Building, Los Angeles 54, Calif. "The Story of California Oranges and Lemons," "Pointers for a Pin-Up Girl," "Sunkist Food Lessons," and other literature; "Golden Foods," leaflet and two-reel, 16-mm. sound film; pictures and charts.

General Mills, Education Section, Dept. of Public Services, Minneapolis 1, Minn. Booklets, posters, films, evaluation devices, news service.

H. J. Heinz Company, Pittsburgh, Pa. "Ever Since Eden" and "Yesterday, Today, and Tomorrow."

Hershey Chocolate Corporation, Hershey, Pa. "Story of Chocolate and Cocoa"; wall chart.

International Harvester Company, 180 N. Michigan Ave., Chicago 1. Crop, farming, and livestock bulletins; motto cards; slides; motion pictures.

Kellogg Company, Department of Home Economics Services, Battle Creek, Mich. "Corn from Field to Breakfast Table," "Health Education Leaflets"; Score Charts; exhibit.

Kraft-Phoenix Cheese Corp., 400 Rush St., Chicago. Booklets on the manufacture and use of cheese.

National Live Stock and Meat Board, 407 S. Dearborn St., Chicago 5. Food value charts.

Quaker Oats Company, 223 W. Jackson Blvd., Chicago 6. "The Inside Story of a Kernel of Oats," and other booklets.

Ralston Purina Company, Checkerboard Square, St. Louis, Mo. Chart and booklets on wheat industry and cereals.

United Fruit Company, 1 Federal St., Boston. Booklets on bananas; outline chart for coloring.

Wilson & Co., Inc., 4100 Ashland Ave., Chicago 9. Meat and by-products charts.

Mineral Products

Aluminum Company of America, Pittsburgh 19, Pa. Booklets; pictures, charts; 16-mm. and 35-mm. sound films.

Bituminous Coal Institute, Educational Department, Southern Building, Washington 5, D.C. "Pertinent Facts About Coal."

Corning Glass Works, Corning, N.Y. Literature.

Far Eastern Sculpstone Company, Inc., 159 E. 28th St., New York 16. "Sculpstone and How To Carve It."

Georgia Marble Company, Tate, Ga. "The Story of Georgia Marble."

International Silver Company, Meriden, Conn. "The Enjoyment of Sterling," "The Simple Secret," and "America's First Silverplate" (to accompany a 16-mm. sound film in color, which tells the history and story of silverplate).

Johns-Manville Sales Corp., Chicago 54. Samples of asbestos, millboard, and shingles; booklets.

Keasby and Matteson, Ambler, Pa. Samples of asbestos.

Koppers Company, Inc., Pittsburgh 19, Pa. Coal products chart.

Portland Cement Association, 33 W. Grand Ave., Chicago 10. "Cement and Concrete Reference Book," and other literature; motion pictures.

Rookwood Pottery Company, Cincinnati, Ohio. Booklet on Rookwood pottery.

U.S. Gypsum Company, 300 W. Adams St., Chicago 6. Exhibit of gypsum rock and limestone, and products.

Textile Products

American Thread Company, Inc., 260 W. Broadway, New York 13. "The Story of Cotton Thread."

Belding-Hemingway-Corticelli, 55 Fremont St., San Francisco. Exhibit, cocoons and skein of silk.

Celanese Corporation of America, 180 Madison Ave., New York 16. Booklets and charts (free); Program of Audio Aids (loaned); swatch package (sold).

Du Pont Company, Rayon Dept., Wilmington, Del. Booklets and information about synthetic fibers.

Goodall Fabrics, Inc., 525 Madison Ave., New York 22. "Fibers, Facts, and Fabrics" (includes samples of fibers and fabrics).

National Federation of Textiles, Inc., 389 Fifth Ave., New York 16. Literature.

Singer Sewing Machine Company, Singer Building, New York. Booklets, wall charts.

William Skinner & Sons, 45 E. 17th St., New York 3. "Romantic Story of Skinner Silks."

Wood Products

American Forest Products Industries, Inc., 1319 18th St., N.W., Washington, D.C. Descriptive bibliography to be used in conservation courses and units.

American Forestry Association, 919 Seventeenth St., N.W., Washington 6, D.C. Bulletins; posters.

Hammermill Paper Company, Erie, Pa. Exhibits; booklets; sound and silent films showing papermaking processes.

Southern Cypress Manufacturers Association, Jacksonville 2, Fla. Booklets on manufacture and uses of cypress.

Strathmore Paper Company, West Springfield, Mass. "Making Expressive Strathmore Papers."

Upson Company, Lockport, N.Y. Exhibit of wallboard samples.

Miscellaneous Products

American Automobile Association, Mills Building, Washington, D.C. Booklets; films; posters; exhibits.

American Dental Association, 222 E. Superior St., Chicago 11. Booklets, pictures, slides, posters, phonograph records (for classroom use only, not for broadcasting); teaching outlines for grades 1–12.

American Humane Education Society, 180 Longwood Ave., Boston. Bulletins, posters, exhibits, animal films.

American Junior Red Cross, Washington, D.C. Materials and teacher guides for elementary and secondary schools in subject-matter fields related to Junior Red Cross education and service programs available through local Red Cross chapter. Periodicals designed for elementary and secondary school use also available. Correspondence exchange arranged for elementary and secondary schools (see p. 140).

Bristol-Myers Company, 630 Fifth Ave., New York 20. Health and cleanliness charts.

Clay-Adams Company, 141 E. 25th St., New York 10. Models, charts, skeletons, 2 x 2 Kodachromes on botany, biology, nursing, medical sciences, and so on. Write for catalogue.

Congoleum Nairn, Inc., 195 Belgrove Drive, Kearny, N.J. Booklets on linoleum and congoleum rugs.

Denoyer-Geppert Company, 5235 Ravenswood Ave., Chicago. Exhibits, specimens, objects, models, charts, maps, globes, slides. Send for catalogue.

Eberhard Faber Pencil Company, 37 Greenpoint Ave., Brooklyn 22. Charts; "Standard Woodworking Joints," "Basic Standards in Mechanical Drafting," and so on.

Esterbrook Steel Pen Manufacturing Company, Camden, N.J. Exhibit, booklets.

General Biological Supply House, Inc., 761 E. 69th Place, Chicago 37. Catalogue of Kodachrome slides; set of 55 Service Leaflets; *Turtox News* (monthly bulletin), and so on.

Good Housekeeping Institute, 57th St. and 8th Ave., New York 19. Booklets: "Chart to Charm," "Good Grooming," "Sleek Closet–Chick Girl," and others.

Goodyear Tire & Rubber Company, Akron, Ohio. "The Story of the Tire"; motion pictures.

The Instructor, Club Exchange Department, F. A. Owen Publishing Company, Dansville, N.Y. Names and addresses of groups and individuals wishing to exchange letters, souvenirs, pictures, products, books, and so on.

LePage's, Inc., Essex Ave., Gloucester, Mass. "Glue Facts," "Do's and Don'ts."

Mutual Life Insurance Company, 34 Nassau St., New York 5. Radio scripts.

National Audubon Society, 1000 Fifth Ave., New York 28. Booklets, motion pictures, slides, pictures, charts, photographs.

National Carbon Company, Inc., 30 E. 42nd St., New York 16. Cutaway dry cell.

National Child Labor Committee, 419 Fourth Ave., New York 16. Literature.

National Recreation Association, 315 Fourth Ave., New York 10. Publications, plays, pageants, games, and so on. Send for lists.

National Safety Council, 20 N. Wacker Drive, Chicago. Booklets, posters, lesson units, exhibits.

National Soap Sculpture Committee, 160 Fifth Ave., New York 10. "Soap Sculpture Manual."

National Tuberculosis Association, 1790 Broadway, New York. Bulletins, posters, motion pictures, filmstrips, exhibits, transcriptions (available through state and local tuberculosis associations).

Pan American Union, Washington, D.C. Music; postage stamps; pictures; sources of maps, and so on.

Philadelphia Commercial Museum, Philadelphia 4. Specimens, literature, and so on. Send for list. (Available to Pennsylvania schools only.)

Procter & Gamble, Educational Department, Cincinnati, Ohio. Booklets: "Hair Hygiene," "A Girl and Her Hair," "Through the Looking Glass to Good Grooming," and others.

Schroeder & Tremayne Inc., 1711 Delmar Blvd., St. Louis 3, Mo. "Story of Sponges and Chamois," "Why," "Cutting Chamois Costs," and "Planted Sponges."

Spencerian Pen Company, 349 Broadway, New York. Exhibit, booklets.

Spool Cotton Company, 350 Fifth Ave., New York. Film, booklets, leaflets.

Van Briggle Art Pottery Company, Colorado Springs, Colo. Booklets.

L. E. Waterman Company, 344 Hudson St., New York 13. Booklets on the development of writing and history of the fountain pen.

Westinghouse Electric Corporation, School Service Department, 306 Fourth Ave., Box 1017, Pittsburgh 30. Charts, posters, booklets.

Wild Flower Preservation Society, Inc., 3740 Oliver St., N.W., Washington, D.C. Bulletins, posters, pictures, exhibits, books.

CHARTS, GLOBES, AND MAPS

Abrams Aerial Survey Corporation, 606 E. Shiawassee St., Lansing, Mich.

A. J. Nystrom & Company, 3333 N. Elston Ave., Chicago.

Denoyer-Geppert Company, 5235 Ravenswood Ave., Chicago.

Foley & Edmunds, 480 Lexington Ave., New York 17.

Keuffel and Esser, 127 Fulton St., New York. Large-sized drawing paper.

McKinley Publishing Company, 1021 Filbert St., Philadelphia.

Milton Bradley Company, New Brunswick, N.J.

National Geographic Society, Sixteenth and M Sts., Washington, D.C.

Pictorial Statistics, Inc., 142 Lexington Ave., New York. Inexpensive booklet, "Instructions for Chartmakers," and 25 different symbol sheets.

Rand McNally & Company, 532 S. Clark St., Chicago 5.

U.S. Department of Commerce, Washington, D.C. Graphic Index of Charts (free); U.S. Coast and Geodetic Survey Charts.

U.S. Department of the Interior, Washington, D.C. U.S. Geological Survey Map.

U.S. Navy Department, Hydrographic Office, Washington, D.C. Charts.

U.S. War Department, Corps of Engineers, Washington, D.C. Charts.

Weber-Costello Company, Chicago Heights, Ill.

TRAVEL, REAL AND IMAGINARY

Nearly all steamship lines and railroad companies publish attractive booklets, folders, maps, charts, and other materials that may be obtained without cost. The following are illustrative of these and other travel information services:

Air-Age Education Research, 100 E. 42nd St., New York 17.

Alaska Steamship Company, Seattle, Wash.

American Junior Red Cross, Washington, D.C.

Associated British and Irish Railways, 9 Rockefeller Plaza, New York 20.
Atchison, Topeka, and Santa Fe Railway System, 80 E. Jackson Blvd., Chicago.
Australian News and Information Bureau, 630 Fifth Ave., New York 20.
C. B. & Q. Railroad, 547 West Jackson Blvd., Chicago.
Canadian Information Service, 84 E. Randolph St., Chicago.
Capitol Greyhound Travel Bureau, 245 W. 50th St., New York.
China Society of America, 570 Lexington Ave., New York.
Cunard Line, 25 Broadway, New York.
French Line, Educational Department, 610 Fifth Ave., New York 20.
Greyhound Travel Bureau, 920 Superior Ave., Cleveland.
Hamburg American Line, 28 Broadway, New York.
The International Friendship League, Inc., 603 Boylston St., Boston.
Italian Tourist Information, 626 Fifth Ave., New York 20.
Kansas State Teachers College, Extension Division, Emporia, Kans. Excellent list of geography materials.
National Child Welfare Association, 70 Fifth Ave., New York.
National Council for the Prevention of War, 532 Seventh St., Washington, D.C.
N. Y. K. Line, 25 Broadway, New York.
Northern Pacific Railroad Company, Passenger Traffic Department, St. Paul, Minn.
Norwegian Travel Information, 580 Fifth Ave., New York.
Pan American World Airways, 28–19 Bridge Plaza North, Long Island City 1, N.Y.
Southern Pacific Company, 65 Market St., San Francisco.
U.S. Department of the Interior, National Park Service, Washington, D.C.

Photographs and Prints

Abrams Aerial Survey Corporation, 606 E. Shiawassee St., Lansing, Mich.
Art Education, Inc., 6 E. 34th St., New York.
Art Extension Press, Inc., Westport, Conn.
Art Institute, Chicago.
Artext Prints, Inc., Westport, Conn.
Asahel Curtis Photo Company, 625 Coleman Building, Seattle, Wash.
Brentano's, Inc., 586 Fifth Ave., New York.
Brown-Robertson Company, Inc., 8–10 E. 19th St., New York.
Brown's Famous Pictures, 38 Lovett St., Boston.
Colonial Art Company, Oklahoma City, Okla.
F E. Compton & Company, 1000 N. Dearborn St., Chicago.
Cosmopolitan Print Department, 119 W 40th St., New York.
Denoyer-Geppert Company, 5235 Ravenswood Ave., Chicago.
Detroit Publishing Company, Detroit.
Edited Picture System, 330 W. 42nd St., New York.
Elson Art Publication, School St., Belmont, Mass.

General Biological Supply House, 761 E. 69th Place, Chicago.
George Washington Memorial Association, 386 Fourth Ave., New York.
Grolier Society, 2 W. 45th St., New York.
House of Art, 59 W. 19th St., New York.
Informative Classroom Pictures, 1209 Kalamazoo Ave., Grand Rapids, Mich.
International News Photos, 235 E. 45th St., New York.
Rudolph Lesch, 225 Fifth Ave., New York.
Medici Society of America, 755 Boylston St., Boston.
Metropolitan Museum of Art, New York.
Milton Bradley Company, Springfield, Mass.
National Child Welfare Association, Inc., 70 Fifth Ave., New York.
National Geographic Society, Sixteenth and M Sts., Washington 6, D.C.
Perry Pictures Company, Malden, Mass.
Photographic History Service, Randolph-Wells Building, Chicago.
Poster-Lesson-Course, Scientific Education Publishers, Los Angeles.
Publishers Photo Service, Inc., 105 W. 40th St., New York.
Raymond & Raymond, Inc., 40 E. 52nd St., New York.
Swedish State Railways, Travel Information Bureau, 551 Fifth Ave., New York.
University Prints, 11 Boyd St., Newton, Mass.
E. Weyne, 794 Lexington Ave., New York.
Wild Flower Preservation Society, 3740 Oliver St., N.W., Washington, D.C.
Williams, Brown & Earle, Inc., 918 Chestnut St., Philadelphia.
H. W. Wilson Company, 950 University Ave., New York.
Yosemite Park & Curry Company, Yosemite National Park, Calif.

POST CARDS

Post cards, which may be used for both nonprojection and projection purposes, may be obtained from the following companies:

Art

American News Company, 131 Varick St., New York.
British Museum, London, England.
Canada Railway News Company, Ltd., Toronto, Canada.
International Art Publishing Company, 242 W. Lafayette Blvd., Detroit.
C. P. Johnson Company, Seattle, Wash.

Scenic

Detroit Publishing Company, Detroit.
Hawaii and South Seas Curio Company, Honolulu, Hawaii.
Pacific Novelty Company, San Francisco.
Philadelphia Post Card Company, Philadelphia.
Rotograph Company, Inc., 817 Broadway, New York.
Santa Fe Company, San Francisco.
Southern Pacific Company, Oakland Pier, Oakland, Calif.

ILLUSTRATED MAGAZINES

A great deal of useful material may be obtained from such illustrated magazines as the following:

Asia. Asia Magazine, Inc., 461 Eighth Ave., New York.
Current History. New York Times Company, New York.
Economic Geography. Clark University, Worcester, Mass.
Good Housekeeping. 119 W. 40th St., New York.
Japan. Toyo Kisen Kaisha Company, 551 Market St., San Francisco.
Ladies' Home Journal. Curtis Publishing Company, Springfield, Ohio.
Life. 540 N. Michigan Ave., Chicago.
Mentor. Crowell Publishing Company, Springfield, Ohio.
National Geographic Magazine. Hubbard Memorial Hall, Washington, D.C.
Nature Magazine. American Nature Association, Washington, D.C.
Travel. Robert McBride Company, 7 W. 16th St., New York.

ILLUSTRATED BOOKS

"Compton's Pictured Encyclopedia," F. E. Compton & Company, 1000 N. Dearborn St., Chicago, Ill.
"Picture Fact Books," Picture Fact Associates, Hinds, Hayden & Eldredge, Inc., New York.

PROJECTORS AND SLIDES

Stereographs and Stereoscopes

Keystone View Company, Meadville, Pa.
Viewmaster Company, Portland, Oregon.

Slides and Filmstrips

American Council on Education, 744 Jackson Place, N.W., Washington 6, D.C.
American Film Registry, 28 E. Jackson Blvd., Chicago 4.
Board of Christian Education and Publication, 1505 Race St., Philadelphia.
Central Scientific Company, 1700 Irving Park Blvd., Chicago.
Chicago Apparatus Company, 1735 N. Ashland Ave., Chicago.
Clay-Adams Co., Inc., 44 E. 23rd St., New York 10.
Coast Visual Education Co., 143 W. Washington Blvd., Los Angeles 15.
Color Slides Cooperative, McCormick Hall, Princeton, N.J.
Colorcraft Studios, 6 N. Michigan Ave., Chicago.
Conrad Slide and Projection Company, Superior, Wis.
Coronet Films, 919 N. Michigan Ave., Chicago 11.
Denoyer-Geppert Company, 5235 Ravenswood Ave., Chicago.
Division of Motion Pictures, U.S. Department of the Interior, Washington, D.C.
Educators Visual-aid Service, Room 222, Nickels Arcade, Ann Arbor, Mich.
Encyclopaedia Britannica Films Inc., 20 N. Wacker Drive, Chicago 6.
Eye Gate House, Inc., 330 W. 42nd St., New York.
Fairchild Aerial Surveys, Inc., 224 E. 11th St., Los Angeles.

H. E. Floercky, 543 Muirfield Rd., Los Angeles.
General Biological Supply House, 761 East 69th Place, Chicago.
General Electric Company, Schenectady, N.Y.
Harrison Crandall, Crandall Studios, Moran, Wyo.
Henry G. Peabody, Pasadena, Calif.
International Art Prints, 64 E. Lake St., Chicago.
Jam Handy Organization, 2821 E. Grand Blvd., Detroit.
Keystone View Company, Meadville, Pa.
Klein & Goodman, 18 S. 10th St., Philadelphia, Pa.
McIntosh Lantern Slide Service, 30 E. Randolph St., Chicago.
National Audubon Society, 1000 Fifth Ave., New York 28.
National Studios, Inc., 145 W. 45th St., New York.
Philip Photo Visual Service, 1218 American Ave., Long Beach, Calif.
Photographic History Service, 5127 Franklin Ave., Hollywood, Calif.
Projected Books, Inc., Ann Arbor, Mich.
Sims Visual Music Company, Quincy, Ill.
Society for Visual Education, Inc., 100 E. Ohio St., Chicago.
Travelore Films, 259 E. First St., Salt Lake City, Utah.
U.S. Office of Education, Federal Security Agency, Washington, D.C.
Utah Parks Company, Cedar City, Utah.
Visual Sciences, Box 599, Suffern, N.Y.
Westinghouse Electric Company, Motion Picture Division, Pittsburgh, Pa.
William L. Morgan, P. O. Box 174, Monterey, Calif.
Williams, Brown, & Earle, Inc., 918 Chestnut St., Philadelphia.
Young America Films, Inc., 18 E. 41st St., New York 17.

Slide and Opaque Projectors

American Optical Company, Instrument Division, Buffalo, N.Y.
Argus Corporation, Ann Arbor, Mich.
Bausch & Lomb Optical Company, Rochester, N.Y.
Bell & Howell Company, 7000 McCormick Road, Chicago.
Charles Beseler Company, 131 East 23rd St., New York.
Eastman Kodak Company, Rochester, N.Y.
Keystone View Company, Meadville, Pa.
Society for Visual Education, Inc., 100 E. Ohio St., Chicago.
Spencer Lens Company, Buffalo, N.Y.
Spindler & Sauppe, 2201 Beverly Blvd., Los Angeles 4.
Trans-Lux Daylight Picture Company, 247 Park Ave., New York.
Victor Animatograph Company, Davenport, Iowa.

Slide-making Materials

Celluloid Corporation, 290 Ferry St., Newark, N.J.
Chicago Apparatus Company, 1735 N. Ashland Ave., Chicago.
Eastman Kodak Company, Rochester, N.Y.
Ideal Pictures Corporation, 28–34 E. 8th St., Chicago.

Keystone View Company, Meadville, Pa.
E. Leitz, Inc., 60 E. 10th St., New York.
National Theatre Supply Company, 90 Gold St., New York. (Branches in 26 principal cities.)
New York Scientific Supply Company, 28 W. 30th St., New York.
Radio Mat Slide Company, Inc., 1819 Broadway, New York.
Scarborite Colors, Inc., Scarborough-on-Hudson, N.Y.
Slide Craft Company, South Orange, N.J.
Society for Visual Education, Inc., 100 E. Ohio St., Chicago.
Victor Animatograph Company, Davenport, Iowa.
Williams, Brown, & Earle, Inc., 918 Chestnut St., Philadelphia.

SLIDE AND FILMSTRIP PROJECTORS

American Optical Company, Instrument Division, Buffalo, N.Y.
Ampro Corporation, 2839 N. Western Ave., Chicago.
Bausch & Lomb Optical Company, Rochester, N.Y.
Bell & Howell Company, 1801 Larchmont Ave., Chicago.
Charles Beseler Company, 60 Badger Ave., Newark, N.J.
DeVry Corporation, 1111 Armitage Ave., Chicago 14.
Eastman Kodak Company, Rochester, N.Y.
GoldE Manufacturing Co., 1220-c W. Madison, Chicago 7.
International Industries, Inc., Ann Arbor, Mich.
La Belle Industries, Inc., Oconomowoc, Wis.
E. Leitz, Inc., 60 E. 10th St., New York.
Society for Visual Education, Inc., 100 E. Ohio St., Chicago.
Viewlex, 35 Queens Blvd., Long Island City, N.Y.

SOUND FILMSTRIP PROJECTORS

Magnavox Company, Inc., Fort Wayne, Ind.
O. J. McClure Talking Pictures, 1115 W. Washington St., Chicago.
Operadio Manufacturing Company, 100 N. 11th St., St. Charles, Ill.
Pacific Sound Corporation, 1524 Cahuenga Blvd., Hollywood, Calif.
Society for Visual Education, Inc., 100 E. Ohio St., Chicago.
Webster Electric Company, Racine, Wis.

SOUND FILMSTRIPS[3]

American Telephone & Telegraph Co., Motion Picture Div., 195 Broadway, New York.
American Type Founders, Inc., Elizabeth, N.J.

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[3] "The Sound Slidefilm Guide" (3d. ed., May, 1949), published by Business Screen Magazine, Chicago, includes nearly 600 listings on a wide variety of subjects.

Business Education Visual Aids, 104 W. 61st St., New York 23.
Castle Films, Division of United World Films, Inc., RCA Bldg., New York 20.
Cathedral Films, 1970 N. Cahuenga Blvd., Hollywood 28, Calif.
Chicago Film Studios, Chicago Film Laboratories Inc., 18 W. Walton Place, Chicago 10.
Civil Aeronautics Administration, Audio-visual Training Aids Staff, *A*-165, Commerce Bldg., Washington 25, D.C.
Coca-Cola Co., National Sales Division, 525 Madison Ave., New York 22.
Commercial Films Inc., 1800 E. 30th St., Cleveland, Ohio.
Crowley Milner & Co., Gratiot Ave., Detroit.
Employer's Mutual Liability Insurance Co., Engineering Dept., Wausau, Wis.
Jam Handy Organization, 2821 E. Grand Blvd., Detroit 11.
Metropolitan Life Insurance Co., Health & Welfare Div., 1 Madison Ave., New York 10.
Modern Talking Pictures Service, 9 Rockefeller Plaza, New York 20.
National Conservation Bureau, Education Div., 60 John St., New York 10.
New York, New Haven, and Hartford Railroad Co., Grand Central Terminal, New York 17.
Standard Oil Company of Indiana, 910 S. Michigan Ave., Chicago 80.
The Travelers Insurance Co., 700 Main, Hartford, Conn.
U.S. Office of Education, Visual Aids Division, Washington, D.C.
Westinghouse Electric Corporation, Film Section, Box 868, 511 Wood St., Pittsburgh 30, Pa.
Zurich Insurance Companies, 135 S. LaSalle St., Chicago 3.

Microfilm Cameras and Readers

American Optical Company, Instrument Division, Buffalo, N.Y.
Folmer-Graflex Corporation, Photorecord Department, Rochester, N.Y.
Recordak Corporation, 350 Madison Ave., New York.

Film Cabinets

American Film-Safe Corporation, 1800 Washington Blvd., Baltimore.
Belson Manufacturing Company, 800 Sibley St., Chicago.
Chicago Cinema Products Company, 1736 N. Springfield Ave., Chicago.
Edward H. Wolk, 1018 S. Wabash Ave., Chicago.
E. E. Fulton Company, 1018 S. Wabash Ave., Chicago.
Film Sets, Inc., 1956 N. Seminary Ave., Chicago.
Good-All Electric Manufacturing Company, 251 Spruce St., Ogallala, Nebr.
National Theatre Supply Company, 90 Gold St., New York.
Neumade Products Corporation, 427 W. 42nd St., New York.
Wenzel Company, 2507 S. State St., Chicago.

FILMS

Films may be rented from numerous sources throughout the United States. Space does not permit the inclusion of a complete list of sources. Consequently, the authors recommend the following publications:

"The Blue Book of 16mm Films," Educational Screen, Inc., 64 E. Lake St., Chicago, 1949.

"Educational Film Guide," D. E. Cook and K. M. Holden, The H. W. Wilson Company, New York, 1948 (published annually).

"Educators Guide to Free Films," Educators Progress Service, Randolph, Wis., 1949 (published annually).

"Educator's Directory," Continental Press, Harrisburg, Pa.

"Films for Classroom Use," Teaching Films Custodians, 25 W. 43rd St., New York 18.

"Films for Music Education," Music Educators National Conference, 64 E. Jackson Blvd., Chicago 4, 1949.

Films of the Nations, Inc., 55 W. 45th St., New York 19.

"Film World" (film and industry directory), Film World, 6060 Sunset Blvd., Hollywood 28, Calif., 1948.

"Free Films: 16mm. Silent and Sound" (L. Heimers), New Jersey State Teachers College, Upper Montclair, N.J., 1947.

"Guide to United States Government Motion Pictures," vol. 1, no. 1, U.S. Government Printing Office, Washington, D.C., 1947.

"Official Films," Educational Film Library Association, Inc., 25 W. 45th St., New York.

"Selected Educational Pictures," American Council on Education, Washington, D.C., 1942.

"Slide Films and Motion Pictures to Help Instructors," Jam Handy Organization, 2821 E. Grand Blvd., Detroit 11, 1943.

"Yearbook and Audio-Visual Directory," Non-Theatrical Film Association, Inc., 303 Lexington Ave., New York.

The above publications list the names of the various companies that have films either for sale or for rent. In addition, they include a great many companies that circulate films without charge other than transportation. In most of the states there are circulating libraries operated by universities, teachers colleges, and other educational institutions. A complete list of these libraries in the Middle West may be secured from the Victor Animatograph Company, Davenport, Iowa.

Educational Film Library Association, Inc., Suite 1000, 1600 Broadway, New York 19, publishes a number of pertinent catalogues and the *EFLA Bulletin* and also sponsors a Film Evaluation Service. (See footnote, p. 231.)

Films that have been definitely prepared for use in the classroom may be purchased from the following companies:

Academy Films, 844 Seward, Hollywood 38, Calif.

Bailey Films, Inc., 2044 Berendo, Hollywood 27, Calif.

Bray Studios, Inc., Educational Department, 729 Seventh Ave., New York 19.
Business Education Visual Aids, 104 W. 61st St., New York 23.
Carl Mahnke Productions, 215 East 3rd St., Des Moines, Iowa.
Castle Films, Division of World Films, Inc., 30 Rockefeller Plaza, New York 20.
Coronet Instructional Films, Inc., 64 E. South Water St., Chicago.
Dudley Picture Corporation, 9908 Santa Monica Blvd., Beverley Hills, Calif.
Encyclopaedia Britannica Films Inc., Wilmette, Ill.
Films Incorporated, 330 W. 42nd St., New York.
Frith Films, Box 565, Hollywood, Calif.
Garrison Film Distributors, 729 Seventh Ave., New York.
Harry Grubbs, Cinemart Bldg., 6912 Hollywood Blvd., Hollywood 28, Calif.
Paul Hoefler Productions, 612½ S. Ridgeley, Los Angeles 36.
International Film Foundation, 2600 Broadway, New York 19.
Johnston Hunt Production, 1133 North Highland Ave., Hollywood 38, Calif.
Knowledge Builders, 625 Madison Ave., New York.
Simmel-Meservey, 321 S. Beverley Drive, Beverley Hills, Calif.
Teaching Films Custodians, 25 W. 43rd St., New York.
The Edited Pictures System, Inc., 165 W. 46th St., New York.
United World Films, Inc., 6569 N. Clark St., Chicago 26.
Young America Films, Inc., 18 E. 41st St., New York 17.

16-MM. MOTION-PICTURE PROJECTORS (Silent and Sound)[4]

Ampro Corporation, 2839 N. Western Ave., Chicago.
Bell & Howell Company, 1801 Larchmont Ave., Chicago.
DeVry Corporation, 1111 W. Armitage Ave., Chicago.
Eastman Kodak Company, Rochester, N. Y.
Forway Corporation, 245 W. 55th St., New York 19.
Holmes Projector Company, 1813 Orchard St., Chicago 14.
Movie-Mite Corporation, 1105 E. 15th St., Kansas City 6, Mo.
Natco, Inc., 505 N. Sacramento Blvd., Chicago 12.
Radio Corporation of America, RCA Victor Division, Camden, N.J.
Revere Camera Co., Chicago 16.
Victor Animatograph Company, Davenport, Iowa.

PROJECTION SCREENS

Da-Lite Screen Company, Inc., 2723 Pulaski Rd., Chicago.
Radiant Manufacturing Co., 1293 S. Talman Ave., Chicago 8.
Raven Screen Corporation, 145 E. 24th St., New York.

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[4] "The 1948–49 Blue Book of Audio-visual Equipment" may be obtained from 812 North Dearborn St., Chicago 10. It lists technical data, price, and so on, for all existing models of various types of projectors and screens. It was prepared as an official project of the National Association of Visual Education Dealers by the editors of *Business Screen.*

35-MM. AND 16-MM. MOTION-PICTURE CAMERAS

Agfa-Ansco Corporation, Binghamton, N.Y.
Argus Corporation, Ann Arbor, Mich.
Bell & Howell Company, 1801 Larchmont Ave., Chicago.
Carl Zeiss, Inc., 485 Fifth Ave., New York.
DeVry Corporation, 1111 W. Armitage Ave., Chicago.
Eastman Kodak Company, Rochester, N.Y.
Folmer-Graflex Corporation, Rochester, N.Y.
International Projector Corporation, 90 Gold St., New York.
E. Leitz, Inc., 730 Fifth Ave., New York.
Victor Animatograph Corporation, Davenport, Iowa.

EXPOSURE METERS

DeJur-Anesco Corporation, Long Island City, N.Y.
G-M Laboratories, Inc., 4272 N. Knox Ave., Chicago.
General Electric Company, Schenectady, N.Y.
Hickok Electrical Instrument Company, 10581 Dupont Ave., Cleveland, Ohio.
Western Electrical Instrument Corporation, Newark, N.J.
Willoughby Camera Stores, Inc., 110 W. 32nd St., New York.

PROJECTION SUPPLIES AND EQUIPMENT

Ampro Corporation, 2839 N. Western Ave., Chicago.
Bell & Howell Company, 7000 McCormick Rd., Chicago.
DeVry Corporation, 1111 Armitage Ave., Chicago.
Eastman Kodak Company, Rochester, N.Y.
Natco, Inc., 505 N. Sacramento Blvd., Chicago 12.
National Theatre Supply Company, 90 Gold St., New York.
Neumade Products Corporation, 427 W. 42nd St., New York.
Radio Corporation of America, RCA Victor Division, Camden, N.J.
Victor Animatograph Company, Davenport, Iowa.

ACOUSTICAL PRODUCTS

General Sources

Association for Education by Radio, 228 N. LaSalle St., Chicago.
Bureau of Educational Research Radio Division, Ohio State University, Columbus.
Columbia Broadcasting System, 485 Madison Ave., New York.
Institute for Education by Radio, "Yearbooks" (1930–), Ohio State University, Columbus.
National Association of Broadcasters, Educational Department, 1626 K St., N.W., Washington, D.C.
National Broadcasting Company, 30 Rockefeller Plaza, New York 20.
National Committee on Education by Radio, 1 Madison Ave., New York.
Radio Manufacturers Association, 1317 F St., N.W., Washington 4, D.C.

Station WLW, The Nation's School of the Air, Cincinnati.
U.S. Office of Education, Federal Radio Education Committee, Washington, D.C.
The Association for Education by Radio publishes a monthly bulletin, *Journal of the AER*, and the Radio Division, Bureau of Educational Research, Columbus, publishes *The News Letter.*

Radio Receiving Sets

Admiral Corporation, 3800 W. Cortland St., Chicago.
Crosley Radio Corporation, Cincinnati, Ohio.
Emerson Radio and Phonograph Corporation, 111 Eighth Ave., New York.
Farnsworth Radio & Television Company, Fort Wayne, Ind.
Galvin Manufacturing Corporation, Chicago.
Philco Radio & Television Corporation, Philadelphia, Pa.
RCA Manufacturing Company, Inc., Educational Department, Camden, N.J.
Stromberg-Carlson Manufacturing Company, 100 Carlson Rd., Rochester, N.Y.
Westinghouse Electric Company, Pittsburgh, Pa.
Zenith Radio Corporation, 6001 W. Dickens St., Chicago.

Television Equipment and Supplies

Columbia Broadcasting System, Inc., New York.
Don Lee Broadcasting System, Inc., Hollywood, Calif.
Allen B. Dumont Laboratories, Inc., New York.
General Electric Company, Schenectady, N.Y.
National Broadcasting System Company, Inc., New York.
Philco Radio & Television Corporation, Philadelphia.
Radio Corporation of America, Camden, N.J.
Zenith Radio Corporation, Chicago.

Microphones, Amplifiers, and Public-address Systems

Ampro Corporation, 2839 N. Western Ave., Chicago.
Audio Research, Inc., 105–107 E. 16th St., New York.
Bell & Howell Company, 7000 McCormick Rd., Chicago.
Herman A. DeVry, Inc., 1111 Armitage Ave., Chicago.
Electrical Research Products, 250 W. 57th St., New York.
Electro-Acoustic Products Company, Fort Wayne, Ind.
Jensen Radio Manufacturing Company, 6601 S. Laramie Ave., Chicago.
Kansas City Sound Service Company, 130 W. 18th St., Kansas City, Mo.
Magnavox Company, Inc., Fort Wayne, Ind.
Mellaphone Corporation, Rochester, N.Y.
Motiograph, Inc., 4431 W. Lake St., Chicago.
National Theatre Supply Company, 90 Gold St., New York.
Pacent Engineering Corporation, 79 Madison Ave., New York.
RCA Manufacturing Company, Educational Department, Camden, N.J.
Safety Projector Company, 310 W. Second St., Duluth, Minn.
Stromberg-Carlson Manufacturing Company, 100 Carlson Rd., Rochester, N.Y.
Universal Microphone Company, Ltd., Inglewood, Calif.

Webster Electric Company, Racine, Wis.
Western Electric Company, 250 W. 57th St., New York.

PHONOGRAPHS AND RECORD PLAYERS

Columbia Phonograph Company, New York.
Electro-Acoustics Products, Inc., Fort Wayne, Ind.
Emerson Radio and Phonograph Corporation, New York.
Fairchild Recording Company, Woodside, N.Y.
Farnsworth Radio & Television Company, Fort Wayne, Ind.
Magnavox Company, Inc., Camden, N.J.
Philco Radio & Television Corporation, Philadelphia.
RCA Manufacturing Company, Inc., Camden, N.J.
Sonocraft Company, Inc., 45 W. 45th St., New York.
Sonora Electric Phonograph Company, New York.

TRANSCRIPTIONS[5]

Arizona Recording Production, N. Seventh Ave., Phoenix, Ariz.
Boosey & Hawks, Inc., P. O. Box 419, Lynbrook, N.Y.
Columbia Recording Corporation, 1473 Barnum Ave., Bridgeport, Conn.
Columbia Records, Inc., Bridgeport 8, Conn.
J. H. Comstock Company, Ithaca, N.Y.
Department of Radio Education, International Council of Religious Education, 203 N. Wabash Ave., Chicago 1.
Educational Recorders, Inc., 171 S. Los Robles Ave., Pasadena, Calif.
The Federal Radio Education Committee, Federal Security Agency, U.S. Office of Education, Washington 25, D.C.
Henry Holt and Company, Inc., 257 Fourth Ave., New York 10.
The Joint Religious Radio Committee, 287 Fourth Ave., New York 10.
Language Service Center, 18 E. 41st St., N.Y.
The Library of Congress, Music Division, Washington 25, D.C.
The Linguaphone Institute, 30 Rockefeller Plaza, New York 20.
National Council of Teachers of English, 221 W. 68th St., Chicago.
National Safety Council, 20 N. Wacker Drive, Chicago.
Popular Science Publishing Co., Audio-visual Division, 353 Fourth Ave., New York 10.
RCA Manufacturing Company, Inc., Camden, N.J.
Radio Transcription Company of America, Ltd., Hollywood, Calif.
Script and Transcription Exchange, U.S. Office of Education, Washington 25, D.C.
Station WNEW, 501 Madison Avenue, New York.
Training Aids, Inc., 7414 Beverly Blvd., Los Angeles 36.

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[5] In addition to these, selected to represent various parts of the country, many film libraries also rent transcriptions.

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